

SEARCH REQUEST FORM**Scientific and Technical Information Center**

Requester's Full Name: Gregory Cantelmo Examiner #: 75777 Date: 11-22-06
 Art Unit: 1745 Phone Number: 302-1283 Serial Number: 10/821,589
 Mail Box and Bldg/Room Location: 6C81 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: _____

Inventors (please provide full names): _____

Earliest Priority Filing Date: _____

**For Sequence Searches Only* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

Please see attached.

STAFF-USE ONLY

	Type of Search	Vendors and cost where applicable
Searcher: <u>EL</u>	NA Sequence (#) _____	STN <u>\$686.52</u>
Searcher Phone #: _____	AA Sequence (#) _____	Dialog _____
Searcher Location: _____	Structure (#) <u>(6)</u>	Questel/Orbit _____
Date Searcher Picked Up: _____	Bibliographic <u>(anal)</u>	Dr.Link _____
Date Completed: <u>11-24-06</u>	Litigation <u>(anal)</u>	Lexis/Nexis _____
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Online Time: <u>100</u>	Other _____	Other (specify) _____

Anekwe, Imelda (ASRC)

2068267

From: GREGG CANTELMO [gregg.cantelmo@uspto.gov]
Sent: Tuesday, November 21, 2006 5:54 PM
To: STIC-EIC1700
Subject: Database Search Request, Serial Number: 10/821589

Requester:
GREGG CANTELMO (P/1745)
Art Unit:
GROUP ART UNIT 1745
Employee Number:
75777
Office Location:
REM 06C81
Phone Number:
(571) 272-1283
Mailbox Number:
REM 6C81

SCIENTIFIC REFERENCE BR
Sci & Tech Inf. Ctr.
NOV 22 2006
Pat. & T.M. Office

Case serial number:
10/821589
Class / Subclass(es):

Earliest Priority Filing Date:

Format preferred for results:
Paper

Search Topic Information:

Please search the claimed composition. The compound oxide of lithium can include LiCoO₂, LiNiMO₂ (M including various elements (see specification)). The inorganic can be Al₂O₃, MgO, LiFePO₄, Li₃PO₄, LiAlO₂, Li₄Ti₅O₁₂, TiO₂ as examples. Carbon material can include various carbonaceous materials such as carbon, graphite, carbon blacks, etc.
Special Instructions and Other Comments:

WHAT IS CLAIMED IS:

1. A positive active material comprising:
particles comprising a compound oxide of lithium and a transition metal, the compound oxide having a layered structure, a coating layer comprising an inorganic compound and a carbonaceous material being formed on at least part of each surface of the particles.
2. The positive active material according to Claim 1, wherein the inorganic compound is a lithium compound.
3. The positive active material according to Claim 1, wherein the weight ratio of the inorganic compound to the carbonaceous material ranges between 99:1 and 60:40.
4. The positive active material according to Claim 1, wherein the weight ratio of the particles to the coating layers ranges between 98:2 and 70:30.
5. A nonaqueous electrolyte secondary battery comprising:
a negative active material; and
a positive active material comprising particles comprising a compound oxide of lithium and a transition

metal, the compound oxide having a layered structure, a coating layer comprising an inorganic compound and a carbonaceous material being formed on at least part of each surface of the particles.

ABSTRACT OF THE DISCLOSURE

A positive active material is composed of particles of a compound oxide of lithium and a transition metal. This compound oxide has a layered structure. A coating layer of an inorganic compound and a carbonaceous material is formed on at least part of each surface of the particles. The inorganic compound is a lithium compound. The weight ratio of the inorganic compound to the carbonaceous material ranges between 99:1 and 60:40. The weight ratio of the particles to the coating layers ranges between 98:2 and 70:30.



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Bib Data Sheet

CONFIRMATION NO. 1893

SERIAL NUMBER 10/821,589	FILING OR 371(c) DATE 04/09/2004 RULE	CLASS 429	GROUP ART UNIT 1745	ATTORNEY DOCKET NO. 09792909-5854	
APPLICANTS Yosuke Hosoya, Fukushima, JAPAN; Yoshikatsu Yamamoto, Fukushima, JAPAN;					
** CONTINUING DATA *****					
** FOREIGN APPLICATIONS ***** JAPAN P2003-108070 04/11/2003					
IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 06/23/2004					
Foreign Priority claimed <input type="checkbox"/> yes <input type="checkbox"/> no 35 USC 119 (a-d) conditions <input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> Met after met Allowance Verified and Acknowledged _____ Examiner's Signature Initials		STATE OR COUNTRY JAPAN	SHEETS DRAWING 2	TOTAL CLAIMS 5	INDEPENDENT CLAIMS 2
ADDRESS 26263					
TITLE Positive active material and nonaqueous electrolyte secondary battery produced using the same					
FILING FEE RECEIVED 900	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:		<input type="checkbox"/> All Fees <input type="checkbox"/> 1.16 Fees (Filing) <input type="checkbox"/> 1.17 Fees (Processing Ext. of time) <input type="checkbox"/> 1.18 Fees (Issue) <input type="checkbox"/> Other _____ <input type="checkbox"/> Credit		

=> FILE REG

FILE 'REGISTRY' ENTERED AT 16:45:03 ON 24 NOV 2006

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=> DISPLAY HISTORY FULL L1-

FILE 'REGISTRY' ENTERED AT 14:01:10 ON 24 NOV 2006

L1 75882 SEA (LI (L) O)/ELS
L2 270 SEA L1 (L) CO/ELS (L) 3/ELC.SUB
L3 1763 SEA L1 (L) NI/ELS (L) 4/ELC.SUB
L4 1758 SEA L3 NOT C/ELS

FILE 'HCA' ENTERED AT 14:03:27 ON 24 NOV 2006

L5 6055 SEA L2 OR LICOO2
L6 2654 SEA L4 OR LINIMO2 OR LIMNIO2

FILE 'REGISTRY' ENTERED AT 14:03:53 ON 24 NOV 2006

E ALUMINA/CN
L7 1 SEA ALUMINA/CN
E MAGNESIUM OXIDE/CN
L8 1 SEA "MAGNESIUM OXIDE"/CN
E FELIO4P/MF
E LITHIUM IRON PHOSPHATE/CN
L9 858 SEA L1 (L) FE/ELS (L) P/ELS
L10 52 SEA L9 (L) 4/ELC.SUB

FILE 'HCA' ENTERED AT 14:07:56 ON 24 NOV 2006

L11 516514 SEA L7 OR AL2O3 OR ALUMINA# OR (ALUMINUM# OR AL) (W) (OXIDE
OR TRIOXIDE#)
L12 194893 SEA L8 OR MGO OR MAGNESIA# OR (MAGNESIUM# OR MG) (W) OXIDE#
L13 493 SEA L10 OR LIFEPO4

FILE 'REGISTRY' ENTERED AT 14:10:00 ON 24 NOV 2006

L14 9550 SEA L1 (L) P/ELS
L15 20 SEA L14 (L) 3/ELC.SUB
E PHOSPHORIC ACID, TRILITHIUM SALT/CN
L16 6 SEA "PHOSPHORIC ACID, TRILITHIUM SALT"/CN OR "PHOSPHORIC
ACID, TRILITHIUM SALT, DIHYDRATE"/CN OR "PHOSPHORIC
ACID, TRILITHIUM SALT, DODECAHYDRATE"/CN OR "PHOSPHORIC
ACID, TRILITHIUM SALT, HEMIHYDRATE"/CN OR "PHOSPHORIC
ACID, TRILITHIUM SALT, HYDRATE (2:1)"/CN OR "PHOSPHORIC
ACID, TRILITHIUM SALT, MONOHYDRATE"/CN OR "PHOSPHORIC
ACID, TRILITHIUM SALT, PENTAHYDRATE"/CN
L17 5284 SEA L1 (L) AL/ELS
L18 65 SEA L17 (L) 3/ELC.SUB

FILE 'HCA' ENTERED AT 14:13:57 ON 24 NOV 2006
L19 1420 SEA L15 OR L16 OR LI3PO4
L20 2590 SEA L18 OR LIALO2 OR ALLIO2

FILE 'REGISTRY' ENTERED AT 14:14:09 ON 24 NOV 2006
L21 5467 SEA L1 (L) TI/ELS
L22 227 SEA L21 (L) 3/ELC.SUB

FILE 'HCA' ENTERED AT 14:16:50 ON 24 NOV 2006
L23 1701 SEA L22 OR LI4TI5O12

FILE 'REGISTRY' ENTERED AT 14:16:55 ON 24 NOV 2006
E TITANIA/CN
L24 1 SEA TITANIA/CN

FILE 'HCA' ENTERED AT 14:17:48 ON 24 NOV 2006
L25 260245 SEA L24 OR TIO2 OR TITANIA# OR (TITANIUM# OR TI) (W) (OXIDE
OR DIOXIDE#)

FILE 'REGISTRY' ENTERED AT 14:18:00 ON 24 NOV 2006
E CARBON/CN
L26 1 SEA CARBON/CN
E GRAPHITE/CN
L27 1 SEA GRAPHITE/CN

FILE 'HCA' ENTERED AT 14:22:05 ON 24 NOV 2006
L28 667842 SEA L26 OR (CARBON# OR C) (2A) (MATERIAL# OR BLACK# OR
SOURC? OR ELEMENTAL? OR PURE# OR PURIF?) OR CARBONACEOUS?
OR CARBONIFEROUS? OR (CARBON# OR C) (2A) (CONTAIN? OR
CONTG#)
L29 207959 SEA L27 OR GRAPHIT?
L30 439 SEA (L5 OR L6) AND (L11 OR L12 OR L13 OR L19 OR L20 OR
L23 OR L25) AND (L28 OR L29)
L31 251174 SEA (POS# OR POSITIV?) (2A) ELECTROD## OR CATHOD##
L32 229148 SEA BATTERY OR BATTERIES OR (ELECTROLY? OR ELECTROCHEM?
OR GALVANI? OR WET OR DRY OR PRIMARY OR SECONDARY) (2A) (CE
LL OR CELLS) OR WETCELL? OR DRYCELL?
L33 329 SEA L30 AND L31
L34 326 SEA L30 AND L31 AND L32
L35 24 SEA L34 AND L13
L36 23 SEA L34 AND L19
L37 12 SEA L34 AND L20
L38 87 SEA L34 AND L23
L39 119 SEA L34 AND L26
L40 190 SEA L34 AND L27
L41 6 SEA L35 AND L38
L42 2 SEA L36 AND L38

L43 52941 SEA LAYER? (2A) STRUCTUR?
L44 426294 SEA LAMIN? OR LAMEL? OR MULTILAYER? OR (MULTI OR
MULTIPL? OR PLURAL? OR FEW OR SEVERAL OR NUMEROUS OR
MANY OR MULTITUD? OR MANIFOLD? OR MULTIFOLD?) (2A) LAYER?
E COATINGS/CV
L45 43471 SEA "COATING(S)"/CV OR COATINGS/CV
E COATING MATERIALS/CV
L46 284976 SEA "COATING MATERIALS"/CV
E COATING PROCESS/CV
L47 133461 SEA "COATING PROCESS"/CV
L48 9 SEA L34 AND L43
L49 11 SEA L30 AND L43
L50 23 SEA L34 AND L44
L51 11 SEA L34 AND (L45 OR L46 OR L47)
L52 2 SEA L50 AND L51
L53 33 SEA L30 AND L44
L54 20 SEA L30 AND (L45 OR L46 OR L47)
L55 3 SEA L53 AND L54
L56 20 SEA L41 OR L42 OR L48 OR L52 OR L55
L57 19 SEA (L37 OR L49 OR L51) NOT L56
L58 62 SEA (L35 OR L36 OR L50 OR L54) NOT (L56 OR L57)
L59 54 SEA L58 AND L31 AND L32
L60 16 SEA L56 AND 1840-2003/PY, PRY
L61 15 SEA L57 AND 1840-2003/PY, PRY
L62 43 SEA L58 AND 1840-2003/PY, PRY
L63 27 SEA (L56 OR L57 OR L58) NOT (L60 OR L61 OR L62)
L64 37 SEA L59 AND 1840-2003/PY, PRY

=> FILE HCA

FILE 'HCA' ENTERED AT 16:45:35 ON 24 NOV 2006

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=> D L60 1-16 CBIB ABS HITSTR HITIND

L60 ANSWER 1 OF 16 HCA COPYRIGHT 2006 ACS on STN

144:91111 Method for fabrication of rechargeable thin film

battery. Goldner, Ronald B.; Liu, Te-Yang; Goldner, Mark
A.; Gerouki, Alexandra; Haas, Terry E. (Trustees of Tufts College,
USA). U.S. US 6982132 B1 20060103, 25 pp., Cont.-in-part of U.S.
Ser. No. 951,085, abandoned. (English). CODEN: USXXAM.
APPLICATION: US 2000-638444 20000814. PRIORITY: US 1997-951085
19971015.

AB A rechargeable, stackable, thin film, solid-state lithium **electrochem. cell**, thin film lithium **battery** and method for making the same is disclosed. The cell and **battery** provide for a variety configurations, voltage and current capacities. An innovative low temp. ion beam assisted deposition method for fabricating thin film, solid-state anodes, **cathodes** and electrolytes is disclosed wherein a source of energetic ions and evaporants combine to form thin film cell components having preferred crystallinity, structure and orientation. The disclosed **batteries** are particularly useful as power sources for portable electronic devices and elec. vehicle applications where high energy d., high reversible charge capacity, high discharge current and long **battery** lifetimes are required.

IT 7782-42-5, Graphite, uses 39302-37-9,
Lithium titanium oxide 52627-24-4,
Cobalt lithium oxide 168886-50-8, Lithium phosphorus oxide
(method for fabrication of rechargeable thin film **battery**
)

RN 7782-42-5 HCA

CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

RN 39302-37-9 HCA

CN Lithium titanium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Ti	x	7440-32-6
Li	x	7439-93-2

RN 52627-24-4 HCA

CN Cobalt lithium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Co	x	7440-48-4
Li	x	7439-93-2

RN 168886-50-8 HCA

CN Lithium phosphorus oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
P	x	7723-14-0
Li	x	7439-93-2

INCL 429162000; 429152000; 429160000; 429231100; 429231300; 429231800;
429245000; 429319000; 429322000; 029623500

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST **battery** rechargeable thin film fabrication method

IT Secondary **batteries**
(lithium; method for fabrication of rechargeable thin film
battery)

IT Electric vehicles
Films
Ion beams
(method for fabrication of rechargeable thin film **battery**
)

IT Alloys, uses
Nitrides
(method for fabrication of rechargeable thin film **battery**
)

IT Electric apparatus
(portable; method for fabrication of rechargeable thin film
battery)

IT Evaporation
(thermal; method for fabrication of rechargeable thin film
battery)

IT 7429-90-5, Aluminum, uses 7439-93-2D, Lithium, intercalation
compd. 7440-02-0, Nickel, uses 7440-47-3, Chromium, uses
7440-48-4, Cobalt, uses 7440-50-8, Copper, uses **7782-42-5**
, **Graphite**, uses 11099-19-7 11104-61-3, Cobalt oxide
11113-67-0, Iron lithium oxide 11115-87-0, Hafnium nitride
11116-16-8, Titanium nitride 11126-15-1, Lithium vanadium oxide
12033-62-4, Tantalum nitride 12646-13-8, Aluminum lithium silicate
12648-34-9, Niobium nitride 12674-04-3, Vanadium nitride
39300-70-4, Lithium nickel oxide **39302-37-9**, Lithium
titanium oxide 39448-96-9, **Graphite**
lithium 39457-42-6, Lithium manganese oxide 51177-06-1, Chromium
lithium oxide **52627-24-4**, Cobalt lithium oxide
119173-61-4, Zirconium nitride 160479-36-7, Lithium tin oxide
163612-99-5, Indium lithium tin oxide **168886-50-8**, Lithium
phosphorus oxide 184905-46-2, Lithium nitrogen phosphorus oxide
872345-59-0, Indium lithium oxide 872345-60-3
(method for fabrication of rechargeable thin film **battery**
)

L60 ANSWER 2 OF 16 HCA COPYRIGHT 2006 ACS on STN

141:368309 Procedure for the fabrication of electrodes and high-energy lithium all-plastics **batteries**. Naarmann, Herbert; Kruger, Franz Josef (Dilo Trading A.-G., Switz.). Ger. Offen. DE 10314826 A1 20041021, 8 pp. (German). CODEN: GWXXBX. APPLICATION: DE 2003-10314826 20030401.

AB The invention concerns fabrication processes for electrodes and high-energy lithium all-plastics **batteries**. The high-energy lithium all-plastics **batteries** contain intercalating **carbon materials** as anode material and Li intercalating metal oxides as **cathode** material, in each case with a dispersed polymer binder as well as further **battery**-specific components for the electrode masses. The electrodes are fabricated by mixing intimately the solid materials and homogenized with a polymer binder dispersion, and then the obtained electrode mass as single-phase suspension is applied on the current collector. By subsequent drying, preferably with a high frequency dryer, and the subsequent **lamination**, electrodes used in high-energy lithium all-plastics **batteries** are obtained.

IT 7440-44-0, Carbon, uses
(mesocarbon microbeads; procedure for fabrication of electrodes and high-energy lithium all-plastics **batteries**)

RN 7440-44-0 HCA

CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

IT 7782-42-5, Graphite, uses 39302-37-9,
Lithium titanium oxide 52627-24-4,
Cobalt lithium oxide
(procedure for fabrication of electrodes and high-energy lithium all-plastics **batteries**)

RN 7782-42-5 HCA

CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

RN 39302-37-9 HCA

CN Lithium titanium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Ti	x	7440-32-6

Li | x | 7439-93-2

RN 52627-24-4 HCA

CN Cobalt lithium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Co	x	7440-48-4
Li	x	7439-93-2

IT 1309-48-4, Magnesium oxide (MgO)
) , uses 1344-28-1, Alumina, uses
(procedure for fabrication of electrodes and high-energy lithium
all-plastics **batteries**)

RN 1309-48-4 HCA

CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)

Mg=O

RN 1344-28-1 HCA

CN Aluminum oxide (Al₂O₃) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

IC ICM H01M004-04

ICS H01M004-40; H01M004-62

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium all plastics **battery** fabrication

IT Fluoro rubber

(Dyneon THV 120; procedure for fabrication of electrodes and
high-energy lithium all-plastics **batteries**)

IT Fluoropolymers, uses

Polyolefins

(binder; procedure for fabrication of electrodes and high-energy
lithium all-plastics **batteries**)

IT Glycols, uses

(ethers; procedure for fabrication of electrodes and high-energy
lithium all-plastics **batteries**)

IT Ethers, uses

(glycol; procedure for fabrication of electrodes and high-energy
lithium all-plastics **batteries**)

IT Primary **batteries**

(lithium; procedure for fabrication of electrodes and high-energy
lithium all-plastics **batteries**)

IT Perfluoro compounds

(perfluoroalkyl ethers, binder, terpolymer, with
hexafluoropropylene and vinylidene fluoride; procedure for

- fabrication of electrodes and high-energy lithium all-plastics **batteries**)
- IT Ethers, uses
(perfluoroalkyl, binder, terpolymer, with hexafluoropropylene and vinylidene fluoride; procedure for fabrication of electrodes and high-energy lithium all-plastics **batteries**)
- IT **Battery electrodes**
(procedure for fabrication of electrodes and high-energy lithium all-plastics **batteries**)
- IT **Carbon black**, uses
(procedure for fabrication of electrodes and high-energy lithium all-plastics **batteries**)
- IT Silicates, uses
(procedure for fabrication of electrodes and high-energy lithium all-plastics **batteries**)
- IT **Coating process**
(spray; procedure for fabrication of electrodes and high-energy lithium all-plastics **batteries**)
- IT 9002-88-4, Polyethylene 9003-07-0, Polypropylene 9003-17-2, Polybutadiene 9003-27-4, Polyisobutene 9003-29-6, Polybutene 9003-31-0, Polyisoprene 9011-17-0D, Hexafluoropropylene-vinylidene fluoride copolymer, terpolymer with perfluoroalkoxy ether
(binder; procedure for fabrication of electrodes and high-energy lithium all-plastics **batteries**)
- IT **7440-44-0**, Carbon, uses
(mesocarbon microbeads; procedure for fabrication of electrodes and high-energy lithium all-plastics **batteries**)
- IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 463-79-6D, Carbonic acid, alkyl ester 7429-90-5, Aluminum, uses 7439-93-2D, Lithium, organo borate 7440-50-8, Copper, uses **7782-42-5**, Graphite, uses 12627-14-4, Lithium silicate 21324-40-3, Lithium hexafluorophosphate 37296-91-6, Lithium molybdenum oxide 37349-20-5, Lithium tungsten oxide 39300-70-4, Lithium nickel oxide **39302-37-9**, Lithium **titanium oxide** 39457-42-6, Lithium manganese oxide 51177-06-1, Chromium lithium oxide **52627-24-4**, Cobalt lithium oxide 244761-29-3, Lithium bis(oxalato)borate
(procedure for fabrication of electrodes and high-energy lithium all-plastics **batteries**)
- IT **1309-48-4**, Magnesium oxide (MgO), uses **1344-28-1**, Alumina, uses 7440-31-5, Tin, uses 7631-86-9, Silica, uses 9003-39-8, Polyvinylpyrrolidone
(procedure for fabrication of electrodes and high-energy lithium all-plastics **batteries**)

secondary **battery**. Takahashi, Takeshi; Oba, Takeshi; Fujino, Kenji; Tokuno, Junichi; Morizaki, Masuhiro; Kondo, Takeyuki; Seyama, Jun (Nichia Corporation, Japan). Eur. Pat. Appl. EP 1463132 A2 20040929, 54 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK. (English). CODEN: EPXXDW. APPLICATION: EP 2004-7076 20040324. PRIORITY: JP 2003-83806 20030325; JP 2003-282341 20030730; JP 2003-358885 20031020; JP 2003-432856 20031226.

AB Disclosed is a **pos. electrode** active material for a nonaq. electrolyte secondary **battery** having at least a lithium-transition metal composite oxide of a **layer structure**, in which an existence ratio of at least one selected from the group consisting of elements which may become tetravalent and magnesium is 20% or more on a surface of the lithium-transition metal composite oxide. By use of this **pos. electrode** active material, a nonaq. electrolyte secondary **battery** having excellent **battery** characteristics, specifically, having excellent high rate characteristics, cycle characteristics, low-temp. characteristics, thermal stability, and the like, under the even more harsh environment for use can be realized.

IT 131344-56-4, Cobalt lithium nickel oxide
(**cathode** active material for nonaq. electrolyte secondary **battery**)

RN 131344-56-4 HCA

CN Cobalt lithium nickel oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Co	x	7440-48-4
Ni	x	7440-02-0
Li	x	7439-93-2

IC ICM H01M004-48

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST **cathode** active material nonaq electrolyte secondary **battery**

IT **Battery cathodes**

Electric vehicles

Secondary **batteries**

(**cathode** active material for nonaq. electrolyte secondary **battery**)

IT **Carbonaceous** materials (technological products)

(**cathode** active material for nonaq. electrolyte secondary **battery**)

- IT Telephones
(cellular phones; **cathode** active material for nonaq. electrolyte secondary **battery**)
- IT Transition metal oxides
(lithiated; **cathode** active material for nonaq. electrolyte secondary **battery**)
- IT Secondary **batteries**
(lithium; **cathode** active material for nonaq. electrolyte secondary **battery**)
- IT Computers
(personal; **cathode** active material for nonaq. electrolyte secondary **battery**)
- IT Lithium alloy, base
(**cathode** active material for nonaq. electrolyte secondary **battery**)
- IT 7439-93-2, Lithium, uses 131344-56-4, Cobalt lithium nickel oxide 177997-13-6, Aluminum cobalt lithium nickel oxide 182442-95-1, Cobalt lithium manganese nickel oxide
(**cathode** active material for nonaq. electrolyte secondary **battery**)
- IT 116713-67-8P, Cobalt lithium titanium oxide 147683-99-6P, Cobalt lithium zirconium oxide 187144-48-5P, Cobalt lithium magnesium oxide 191025-46-4P, Cobalt lithium nickel zirconium oxide 642999-33-5P, Cobalt lithium magnesium zirconium oxide 756879-33-1P
(**cathode** active material for nonaq. electrolyte secondary **battery**)
- L60 ANSWER 4 OF 16 HCA COPYRIGHT 2006 ACS on STN
- 140:426129 Method of fabrication of lithium ion secondary **battery** with Li ion conductive inorganic solid electrolyte. Ysui, Inda (Kabushiki Kaisha Ohara, Japan). Eur. Pat. Appl. EP 1424743 A1 20040602, 13 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK. (English). CODEN: EPXXDW. APPLICATION: EP 2003-27366 20031127. PRIORITY: JP 2002-348532 20021129.
- AB A lithium ion secondary **battery** includes a **pos. electrode**, a neg. electrode and a thin film solid electrolyte including lithium ion conductive inorg. substance. The thin film solid electrolyte has thickness of 20 μm or below and is formed directly on an electrode material or materials for the **pos. electrode** and/or the neg. electrode. The thin film solid electrolyte has lithium ion cond. of 10^{-5} Scm⁻¹ or over and contains lithium ion conductive inorg. substance powder in an amt. of 40 wt.% or over in a polymer medium. The av. grain diam. of the inorg. substance powder is 0.5 μm or below. According to a method for manufg. the lithium ion secondary **battery**,

the thin film solid electrolyte is formed by coating the lithium ion conductive inorg. substance directly on the electrode material or materials for the **pos. electrode** and/or the neg. electrode.

IT 7782-42-5, Graphite, uses 12031-95-7,
Lithium titanium oxide $\text{Li}_4\text{Ti}_5\text{O}_{12}$
12190-79-3, Cobalt lithium oxide CoLiO_2
(method of fabrication of lithium ion secondary **battery**
with Li ion conductive inorg. solid electrolyte)
RN 7782-42-5 HCA
CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

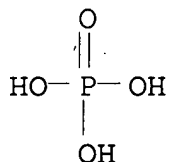
RN 12031-95-7 HCA
CN Lithium titanium oxide ($\text{Li}_4\text{Ti}_5\text{O}_{12}$) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	12	17778-80-2
Ti	5	7440-32-6
Li	4	7439-93-2

RN 12190-79-3 HCA
CN Cobalt lithium oxide (CoLiO_2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IT 10377-52-3, Lithium phosphate
(method of fabrication of lithium ion secondary **battery**
with Li ion conductive inorg. solid electrolyte)
RN 10377-52-3 HCA
CN Phosphoric acid, trilithium salt (8CI, 9CI) (CA INDEX NAME)



●3 Li

- IC ICM H01M010-36
- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 57
- ST lithium ion secondary **battery** inorg solid electrolyte
- IT Glass, uses
(ion conductive; method of fabrication of lithium ion secondary **battery** with Li ion conductive inorg. solid electrolyte)
- IT Secondary **batteries**
(lithium; method of fabrication of lithium ion secondary **battery** with Li ion conductive inorg. solid electrolyte)
- IT **Battery** electrolytes
Crystals
Glass ceramics
(method of fabrication of lithium ion secondary **battery** with Li ion conductive inorg. solid electrolyte)
- IT Polyoxyalkylenes, uses
(method of fabrication of lithium ion secondary **battery** with Li ion conductive inorg. solid electrolyte)
- IT Magnetron sputtering
(radio-frequency; method of fabrication of lithium ion secondary **battery** with Li ion conductive inorg. solid electrolyte)
- IT 7782-42-5, Graphite, uses 12031-95-7,
Lithium titanium oxide **li4ti5o12**
12057-17-9, Lithium manganese oxide **limn2o4** 12190-79-3,
Cobalt lithium oxide **colio2** 302600-21-1, Aluminum lithium titanium
phosphate silicate
(method of fabrication of lithium ion secondary **battery** with Li ion conductive inorg. solid electrolyte)
- IT 10377-52-3, Lithium phosphate 25322-68-3, Peo
(method of fabrication of lithium ion secondary **battery** with Li ion conductive inorg. solid electrolyte)

L60 ANSWER 5 OF 16 HCA COPYRIGHT 2006 ACS on STN

140:426125 Coating of substrates with active material, binder, and thickener for fabrication of **battery** electrodes. Zaghib, Karim; Armand, Michel; Guerfi, Abdelbast; Perrier, Michel; Dupuis,

Elisabeth; Charest, Patrick (Hydro-Quebec, Can.). PCT Int. Appl. WO 2004045007 A2 20040527, 37 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (French). CODEN: PIXXD2. APPLICATION: WO 2003-CA1739 20031113. PRIORITY: CA 2002-2411695 20021113.

AB An electrode for an **electrochem. cell** (esp. a **battery**) is prepd. by coating at least partially the electrode with a film obtained by spreading and drying of an aq. soln. on the electrode support, in which the aq. soln. contains at least an active material, a water-sol. binder, and a water-sol. thickener. Suitable active materials are selected from finely divided (particle size 10-50 μ) metal oxides (e.g., **LiMn2O4**, **LiCoO2**, **LiFePO4**, **LiNiO2**, **Li4Ti5O12**, etc.), ceramics, carbon (including carbon fibers, synthetic **graphite**, and natural **graphite**), metals (e.g., Ag, Sn, and Cu), and semiconductors (esp. Si). Suitable thickeners include natural and modified celluloses (e.g., CM-cellulose and hydroxymethyl cellulose); suitable binders include natural and synthetic rubber. Both anodes and **cathodes** can be prepd. by this method. The method for electrode fabrication is esp. useful for construction of secondary lithium **batteries** with nonaq. electrolytes and polymeric separators.

IT **7440-44-0**, Carbon, uses **7782-42-5**, **Graphite**, uses **12031-95-7**, Lithium **titanium oxide (Li4Ti5O12)** **12190-79-3**, Cobalt lithium oxide (**CoLiO2**) **128975-24-6**, Lithium manganese nickel oxide (**LiMn0.5Ni0.5O2**) (**battery** electrodes; coating of substrates with active material, binder, and thickener for fabrication of **battery** electrodes)

RN 7440-44-0 HCA

CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

RN 7782-42-5 HCA

CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

RN 12031-95-7 HCA

CN Lithium titanium oxide (Li₄Ti₅O₁₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	12	17778-80-2
Ti	5	7440-32-6
Li	4	7439-93-2

RN 12190-79-3 HCA

CN Cobalt lithium oxide (CoLiO₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

RN 128975-24-6 HCA

CN Lithium manganese nickel oxide (Li₂MnNiO₄) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	4	17778-80-2
Ni	1	7440-02-0
Mn	1	7439-96-5
Li	2	7439-93-2

IC ICM H01M004-04

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST **battery** electrode coating carbon encapsulation; thickener
binder **battery** electrode coating

IT Ceramics

Semiconductor materials

(battery electrodes; coating of substrates with active
material, binder, and thickener for fabrication of
battery electrodes)

IT Carbon fibers, uses

Coke

Metals, uses

Oxides (inorganic), uses

(battery electrodes; coating of substrates with active
material, binder, and thickener for fabrication of
battery electrodes)

IT EPDM rubber

- Fluoropolymers, uses
- Polyesters, uses
- Polyoxyalkylenes, uses
 - (**battery** separators; coating of substrates with active material, binder, and thickener for fabrication of **battery** electrodes)
- IT Acrylic rubber
- Epichlorohydrin rubber
- Natural rubber, uses
- Nitrile rubber, uses
- Styrene-butadiene rubber, uses
- Synthetic rubber, uses
 - (binder, for coating of **battery** electrodes; coating of substrates with active material, binder, and thickener for fabrication of **battery** electrodes)
- IT **Battery** anodes
- Battery** cathodes
- Battery** electrodes
- Coating materials
 - (coating of substrates with active material, binder, and thickener for fabrication of **battery** electrodes)
- IT Nitrile rubber, uses
 - (hydrogenated, binder, for coating of **battery** electrodes; coating of substrates with active material, binder, and thickener for fabrication of **battery** electrodes)
- IT Secondary **batteries**
 - (lithium **batteries**; coating of substrates with active material, binder, and thickener for fabrication of **battery** electrodes)
- IT **Battery** electrolytes
 - (nonaq.; coating of substrates with active material, binder, and thickener for fabrication of **battery** electrodes)
- IT Secondary **battery** separators
 - (polymeric; coating of substrates with active material, binder, and thickener for fabrication of **battery** electrodes)
- IT Polysaccharides, uses
 - (thickener, for coating of **battery** electrodes; coating of substrates with active material, binder, and thickener for fabrication of **battery** electrodes)
- IT Tin alloy, base
 - (**battery** electrodes; coating of substrates with active material, binder, and thickener for fabrication of **battery** electrodes)
- IT 9004-32-4, Carboxymethyl cellulose
 - (Cellogen, thickener, for coating of **battery** electrodes; coating of substrates with active material, binder, and thickener for fabrication of **battery** electrodes)
- IT 7440-21-3, Silicon, uses 7440-22-4, Silver, uses 7440-31-5, Tin,

uses 7440-44-0, Carbon, uses 7440-50-8, Copper, uses 7782-42-5, Graphite, uses 12031-65-1, Lithium nickel oxide (LiNiO_2) 12031-95-7, Lithium titanium oxide ($\text{Li}_4\text{Ti}_5\text{O}_{12}$) 12036-22-5, Tungsten oxide (WO_2) 12057-17-9, Lithium manganese oxide (LiMn_2O_4) 12190-79-3, Cobalt lithium oxide (CoLiO_2) 15365-14-7, Iron lithium phosphate (FeLiPO_4) 128975-24-6, Lithium manganese nickel oxide ($\text{LiMn}_{0.5}\text{Ni}_{0.5}\text{O}_2$)

(**battery** electrodes; coating of substrates with active material, binder, and thickener for fabrication of **battery** electrodes)

IT 9002-84-0, Poly(tetrafluoroethene) 9002-88-4, Polyethylene 9003-07-0, Polypropylene 9011-14-7, Poly(methyl methacrylate) 9011-17-0 24937-79-9, Poly(vinylidene fluoride) 25034-77-9, Ethylene-propylene-5-methylene-2-norbornene copolymer 25322-68-3, Polyethylene oxide 25322-69-4, Polypropylene oxide

(**battery** separators; coating of substrates with active material, binder, and thickener for fabrication of **battery** electrodes)

IT 9003-18-3
(nitrile rubber, binder, for coating of **battery** electrodes; coating of substrates with active material, binder, and thickener for fabrication of **battery** electrodes)

IT 9003-18-3
(nitrile rubber, hydrogenated, binder, for coating of **battery** electrodes; coating of substrates with active material, binder, and thickener for fabrication of **battery** electrodes)

IT 96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 2832-49-7, N,N,N',N'-Tetraethylsulfamide 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 90076-65-6, LiTFSI 171611-11-3 244761-29-3, Lithium bis(oxalato)borate
(secondary **battery** nonaq. electrolytes; coating of substrates with active material, binder, and thickener for fabrication of **battery** electrodes)

IT 9003-55-8
(styrene-butadiene rubber, binder, for coating of **battery** electrodes; coating of substrates with active material, binder, and thickener for fabrication of **battery** electrodes)

IT 7429-90-5, Aluminum, uses 12597-68-1, Stainless steel, uses
(substrate, for **battery** electrodes; coating of substrates with active material, binder, and thickener for fabrication of **battery** electrodes)

IT 9004-34-6, Cellulose, uses 37353-59-6, Hydroxymethyl cellulose
(thickener, for coating of **battery** electrodes; coating of substrates with active material, binder, and thickener for fabrication of **battery** electrodes)

L60 ANSWER 6 OF 16 HCA COPYRIGHT 2006 ACS on STN

139:263344 Layered electrodes for lithium cells and **batteries**.

Johnson, Christopher S.; Thackeray, Michael M.; Vaughey, John T.; Kahaian, Arthur J.; Kim, Jeom-soo (The University of Chicago, USA). U.S. Pat. Appl. Publ. US 2003180616 A1 **20030925**, 28 pp. (English). CODEN: USXXCO. APPLICATION: US 2003-365286 20030212. PRIORITY: US 2002-PV357393 20020215.

AB Lithium metal oxide compds. of nominal formula Li_2MO_2 , in which M represents two or more pos. charged metal ions, selected predominantly and preferably from the first row of transition metals are disclosed herein. The Li_2MO_2 compds. have a **layered -type structure**, which can be used as **pos. electrodes** for lithium **electrochem. cells**, or as a precursor for the in-situ electrochem. fabrication of LiMO_2 electrodes. The Li_2MO_2 compds. of the invention may have addnl. functions in lithium cells, for example, as end-of-discharge indicators, or as neg. electrodes for lithium cells.

IT **7440-44-0**, Carbon, processes **7782-42-5**, **Graphite**, processes (layered electrodes for lithium cells and **batteries**)

RN 7440-44-0 HCA

CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

RN 7782-42-5 HCA

CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

IT **12190-79-3P**, Cobalt lithium oxide CoLiO_2
128975-24-6DP, Lithium manganese nickel oxide
 $\text{LiMn}_{0.5}\text{Ni}_{0.5}\text{O}_2$, Li intercalated **128975-24-6P**, Lithium
manganese nickel oxide $\text{LiMn}_{0.5}\text{Ni}_{0.5}\text{O}_2$
(layered electrodes for lithium cells and **batteries**)

RN 12190-79-3 HCA

CN Cobalt lithium oxide (CoLiO_2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

RN 128975-24-6 HCA
 CN Lithium manganese nickel oxide (Li₂MnNiO₄) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	4	17778-80-2
Ni	1	7440-02-0
Mn	1	7439-96-5
Li	2	7439-93-2

RN 128975-24-6 HCA
 CN Lithium manganese nickel oxide (Li₂MnNiO₄) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	4	17778-80-2
Ni	1	7440-02-0
Mn	1	7439-96-5
Li	2	7439-93-2

IC ICM H01M004-48
 ICS H01M004-52; H01M004-50; H01M004-62; C01G045-12; C01G049-02;
 C01G023-04; C01G051-04; C01G053-04
 INCL 429231100; 429232000; 429231200; 429231500; 429224000; 429223000;
 429221000; 429220000; 423593100; 423594200
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 49
 ST lithium **battery** layered electrode
 IT **Battery cathodes**
 Battery electrodes
 (layered electrodes for lithium cells and **batteries**)
 IT Metals, processes
 Oxides (inorganic), processes
 (layered electrodes for lithium cells and **batteries**)
 IT Intermetallic compounds
 Nitrides
 (layered electrodes for lithium cells and **batteries**)
 IT Inorganic compounds
 (layered; layered electrodes for lithium cells and
 batteries)
 IT Secondary **batteries**
 (lithium; layered electrodes for lithium cells and
 batteries)
 IT 109-72-8, n-Butyllithium, processes 546-68-9 1310-66-3, Lithium
 hydroxide monohydrate 7308-67-0, Lithium naphthalide, processes
 7439-93-2, Lithium, processes **7440-44-0**, Carbon, processes

- 7782-42-5, Graphite, processes 244129-80-4,
Manganese nickel hydroxide $\text{Mn}_{0.5}\text{Ni}_{0.5}(\text{OH})_2$
(layered electrodes for lithium cells and **batteries**)
- IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate
21324-40-3, Lithium hexafluorophosphate
(layered electrodes for lithium cells and **batteries**)
- IT 12031-65-1P, Lithium nickel oxide LiNiO_2 12162-79-7P, Lithium
manganese oxide LiMnO_2 12190-79-3P, Cobalt lithium oxide
 CoLiO_2 13824-63-0P, Cobalt lithium phosphate CoLiPO_4
13826-59-0P, Lithium manganese phosphate LiMnPO_4 15365-14-7P, Iron
lithium phosphate FeLiPO_4 128975-24-6DP, Lithium manganese
nickel oxide $\text{LiMn}_{0.5}\text{Ni}_{0.5}\text{O}_2$, Li intercalated 128975-24-6P,
Lithium manganese nickel oxide $\text{LiMn}_{0.5}\text{Ni}_{0.5}\text{O}_2$ 176087-62-0P,
Lithium manganese oxide $\text{Li}_{1-1.33}\text{Mn}_{1.67}\text{O}_4$ 193214-24-3P, Aluminum
cobalt lithium nickel oxide $\text{Al}_{0.05}\text{Co}_{0.15}\text{LiNi}_{0.8}\text{O}_2$ 309242-27-1P,
Cobalt lithium magnesium nickel **titanium oxide**
 $\text{Co}_{0.15}\text{LiMg}_{0.05}\text{Ni}_{0.75}\text{Ti}_{0.05}\text{O}_2$ 346417-97-8P, Cobalt lithium
manganese nickel oxide $\text{Co}_{0.33}\text{LiMn}_{0.33}\text{Ni}_{0.33}\text{O}_2$ 448897-02-7DP,
Lithium manganese nickel **titanium oxide**
 $\text{Li}_{1.02}\text{Mn}_{0.46}\text{Ni}_{0.46}\text{Ti}_{0.05}\text{O}_2$, Li intercalated 448897-02-7P, Lithium
manganese nickel **titanium oxide**
 $\text{Li}_{1.02}\text{Mn}_{0.46}\text{Ni}_{0.46}\text{Ti}_{0.05}\text{O}_2$ 602319-07-3P, Lithium manganese nickel
titanium oxide ($\text{Li}_{2.02}\text{Mn}_{0.46}\text{Ni}_{0.46}\text{Ti}_{0.05}\text{O}_2$)
(layered electrodes for lithium cells and **batteries**)
- IT 7664-41-7, Ammonia, processes
(lithium soln.; layered electrodes for lithium cells and
batteries)

L60 ANSWER 7 OF 16 HCA COPYRIGHT 2006 ACS on STN

138:404345 **Battery** structures, self-organizing structures and
related methods. Chiang, Yet Ming; Moorehead, William Douglas;
Gozdz, Antoni S.; Holman, Richard K.; Loxley, Andrew; Riley, Gilbert
N.; Viola, Michael S. (Al23systems, Inc., USA). U.S. Pat. Appl.
Publ. US 2003099884 A1 20030529, 70 pp., Cont.-in-part of
U.S. Ser. No. 21,740. (English). CODEN: USXXCO. APPLICATION: US
2002-206662 20020726. PRIORITY: US 2001-308360P 20010727; US
2001-21740 20011022.

AB An energy storage device includes a first electrode comprising a
first material and a second electrode comprising a second material,
at least a portion of the first and second materials forming an
interpenetrating network when dispersed in an electrolyte, the
electrolyte, the first material and the second material are selected
so that the first and second materials exert a repelling force on
each other when combined. An electrochem. device, includes a first
electrode in elec. communication with a first current collector; a
second electrode in elec. communication with a second current
collector; and an ionically conductive medium in ionic contact with
the first and second electrodes, wherein at least a portion of the

first and second electrodes form an interpenetrating network and wherein at least one of the first and second electrodes comprises an electrode structure providing two or more pathways to its current collector.

IT 7440-44-0, Carbon, uses 7782-42-5,
Graphite, uses 12190-79-3, Cobalt lithium oxide
 colio2 13463-67-7, **Titanium oxide**,
 uses 37217-08-6, Lithium **titanium oxide**
 liti2o4
 (battery structures, self-organizing structures and
 related methods)

RN 7440-44-0 HCA
 CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

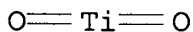
RN 7782-42-5 HCA
 CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

RN 12190-79-3 HCA
 CN Cobalt lithium oxide (CoLiO2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

RN 13463-67-7 HCA
 CN Titanium oxide (TiO2) (8CI, 9CI) (CA INDEX NAME)



RN 37217-08-6 HCA
 CN Lithium titanium oxide (LiTi2O4) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	4	17778-80-2
Ti	2	7440-32-6
Li	1	7439-93-2

IC ICM H01M004-64
ICS H01M004-80; H01M004-58
INCL 429233000; 429235000; 429231950; 429212000; 429231400; 429210000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **battery** self organizing structure
IT **Battery** anodes
 Battery cathodes
 Coating process
 Embossing
 (**battery** structures, self-organizing structures and
 related methods)
IT Fluoropolymers, uses
 Glass, uses
 Polyamines
 Polyimides, uses
 Polyoxyalkylenes, uses
 (**battery** structures, self-organizing structures and
 related methods)
IT Polymers, uses
 (block, Li salt-doped; **battery** structures,
 self-organizing structures and related methods)
IT Primary **batteries**
 (lithium; **battery** structures, self-organizing
 structures and related methods)
IT Intercalation compounds
 (lithium; **battery** structures, self-organizing
 structures and related methods)
IT Azines
 Group VA element compounds
 (phosphazines; **battery** structures, self-organizing
 structures and related methods)
IT 7439-95-4, Magnesium, uses
 (CoLiO₂ doped with; **battery** structures, self-organizing
 structures and related methods)
IT 7440-03-1, Niobium, uses 7440-25-7, Tantalum, uses 7440-32-6,
Titanium, uses 7440-33-7, Tungsten, uses 12042-37-4, AlLi
 (LiFePO₄ doped with; **battery** structures,
 self-organizing structures and related methods)
IT 7429-90-5, Aluminum, uses
 (LiMnO₂ doped with; **battery** structures, self-organizing
 structures and related methods)
IT 68-12-2, Dmf, uses 75-11-6, Diiodomethane 96-49-1, Ethylene
carbonate 105-58-8, DiEthyl carbonate 108-32-7, Propylene
carbonate 616-38-6, DimEthyl carbonate 627-31-6,
1,3-Diiodopropane 1307-96-6, Cobalt monoxide, uses 1313-13-9,
Manganese dioxide, uses 1313-99-1, Nickel oxide (NiO), uses
1314-62-1, Vanadia, uses 1317-34-6, Manganese oxide mn₂o₃

1317-35-7, Manganese oxide Mn_3O_4 1335-25-7, Lead oxide
 1343-98-2, Silicon hydroxide 1344-43-0, Manganese oxide MnO , uses
 1345-25-1, Iron oxide FeO , uses 7226-23-5 7439-93-2, Lithium,
 uses 7439-93-2D, Lithium, intercalation compd. 7440-21-3,
 Silicon, uses 7440-22-4, Silver, uses 7440-31-5, Tin, uses
 7440-36-0, Antimony, uses 7440-42-8, Boron, uses **7440-44-0**
 , Carbon, uses 7440-56-4, Germanium, uses 7440-66-6, Zinc, uses
 7440-69-9, Bismuth, uses 7631-86-9, Silicon oxide, uses
7782-42-5, Graphite, uses 9003-53-6, Polystyrene
 10043-35-3, Boric acid (H_3BO_3), uses 10361-43-0, Bismuth hydroxide
 12002-78-7 12031-65-1, Lithium nickel oxide LiNiO_2 12037-30-8,
 Vanadium oxide V_6O_{11} 12048-27-0, Bili 12057-17-9, Lithium
 manganese oxide LiMn_2O_4 12057-22-6, LiZn 12057-30-6 12057-33-9
 12063-07-9, Iron lithium oxide Fe_2LiO_4 12162-79-7, Lithium
 manganese oxide LiMnO_2 **12190-79-3**, Cobalt lithium oxide
 CoLiO_2 12253-44-0 12338-02-2 12651-23-9, Titanium hydroxide
13463-67-7, Titanium oxide, uses
 14475-63-9, Zirconium hydroxide $\text{Zr}(\text{OH})_4$ 15365-14-7, Iron lithium
 phosphate FeLiPO_4 18282-10-5, Tin dioxide 21651-19-4, Tin oxide
 SnO 24937-79-9, Polyvinylidene fluoride 25014-41-9,
 Polyacrylonitrile 25322-68-3, PEO 25322-69-4, Polypropylene
 oxide **37217-08-6, Lithium titanium oxide**
 LiTi_2O_4 39345-91-0, Lead hydroxide 53262-48-9 55575-96-7,
 Lithium silicide Li_3Si_4 55608-41-8 56627-44-2 61812-08-6,
 Lithium silicide Li_2Si_8 66403-10-9, Lithium boride Li_5B_4
 67070-82-0 71012-86-7, Lithium boride Li_7B_6 74083-26-4
 76036-33-4, Lithium silicide Li_2Si_7 106494-93-3, Lithium silicide
 Li_2Si_5 114778-10-8, Iron lithium sulfate $\text{Fe}_2\text{Li}_2(\text{SO}_4)_3$
 144419-56-7, Cobalt lithium **magnesium oxide**
 $\text{Co}_{0.95}\text{LiMg}_{0.05}\text{O}_2$ 496816-56-9 496816-58-1, Iron lithium zirconium
 phosphate $\text{Fe}_{0.98}\text{LiZr}_{0.02}(\text{PO}_4)$ 531493-25-1, Iron lithium titanium
 phosphate ($\text{Fe}_{0.98}\text{LiTi}_{0.02}(\text{PO}_4)$)

(**battery** structures, self-organizing structures and
 related methods)

IT 99742-70-8, Poly(o-methoxyaniline) 104934-51-2,
 Poly(3-octylthiophene)

(**battery** structures, self-organizing structures and
 related methods)

IT 1303-86-2, Boron oxide (B_2O_3), uses 1304-76-3, Bismuth oxide
 (Bi_2O_3), uses 1314-23-4, Zirconium oxide, uses 1314-56-3,
 Phosphorus oxide (P_2O_5), uses 1317-36-8, Lead oxide (PbO), uses
 7447-41-8, Lithium chloride, uses 7789-24-4, Lithium fluoride,
 uses 10377-51-2, Lithium iodide 12057-24-8, Lithia, uses

(glass; **battery** structures, self-organizing structures
 and related methods)

Sata, Tsutomu (Torekion K. K., Japan). Jpn. Kokai Tokkyo Koho JP 2003017121 A2 20030117, 5 pp. (Japanese). CODEN: JKXXAF.
APPLICATION: JP 2001-200782 20010702.

AB The **battery** has a Li or Li-intercalating anode, a Li-intercalating **cathode**, and a solid electrolyte in between; where the electrolyte is a soln. contg. a Li salt in a room temp. solid arom. carbonate. Another type of the **battery** has a solid polymer electrolyte contg. a crosslinked polyether polymer matrix and the above soln. as continuous phase in the matrix.

IT 7782-42-5, Graphite, uses 12031-95-7, Lithium titanium oxide ($\text{Li}_4\text{Ti}_5\text{O}_{12}$) (anode; compns. and structure of secondary Li **batteries** contg. Li-intercalating electrodes and solid polymer electrolyte solns.)

RN 7782-42-5 HCA

CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

RN 12031-95-7 HCA

CN Lithium titanium oxide ($\text{Li}_4\text{Ti}_5\text{O}_{12}$) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====+=====+=====		
O	12	17778-80-2
Ti	5	7440-32-6
Li	4	7439-93-2

IT 12190-79-3, Cobalt lithium oxide (CoLiO_2) (**cathode**; compns. and structure of secondary Li **batteries** contg. Li-intercalating electrodes and solid polymer electrolyte solns.)

RN 12190-79-3 HCA

CN Cobalt lithium oxide (CoLiO_2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====+=====+=====		
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IC ICM H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary Li **battery** polymer polyether solid carbonate

- electrolyte
- IT Secondary **batteries**
(lithium; compns. and structure of secondary Li **batteries** contg. Li-intercalating electrodes and solid polymer electrolyte solns.)
- IT 7782-42-5, Graphite, uses 12031-95-7, Lithium titanium oxide ($\text{Li}_4\text{Ti}_5\text{O}_{12}$)
(anode; compns. and structure of secondary Li **batteries** contg. Li-intercalating electrodes and solid polymer electrolyte solns.)
- IT 12190-79-3, Cobalt lithium oxide (CoLiO_2) 15365-14-7, Iron lithium phosphate (LiFePO_4)
(**cathode**; compns. and structure of secondary Li **batteries** contg. Li-intercalating electrodes and solid polymer electrolyte solns.)
- IT 79-10-7D, Acrylic acid, polyoxyalkylene derivs. 115383-11-4
(compns. and structure of secondary Li **batteries** contg. Li-intercalating electrodes and solid polymer electrolyte solns.)
- IT 82113-65-3, Bis(trifluoromethane sulfonyl) imide 90076-65-6
(salt, electrolyte; compns. and structure of secondary Li **batteries** contg. Li-intercalating electrodes and solid polymer electrolyte solns.)
- IT 6222-20-4 486459-47-6
(solvent, electrolyte; compns. and structure of secondary Li **batteries** contg. Li-intercalating electrodes and solid polymer electrolyte solns.)

L60 ANSWER 9 OF 16 HCA COPYRIGHT 2006 ACS on STN

137:250290 **Cathode** compositions and their use, particularly in **batteries**. Ravet, Nathalie; Armand, Michel (Universite de Montreal, Can.; Centre National de la Recherche Scientifique). PCT Int. Appl. WO 2002073716 A2 20020919, 16 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (French). CODEN: PIXXD2. APPLICATION: WO 2002-CA341 20020313. PRIORITY: CA 2001-2340798 20010313.

AB The invention relates to a **pos. electrode** compn. contg. ≥ 1 mixed oxide with a spinel or lamellar structure having general formula $\text{Li}_{1-x}\text{M}_1\text{-yAaO}_2\text{-fFf}$, and ≥ 1 mixed phosphate having a general formula $\text{Li}_{1-z}\text{FenMnmPO}_4$ (where $\text{M} = \text{Co, Ni, Mn}$; $\text{A} = \text{Mg, Zn, Al, Fe, Cr, Co, Mn, Ni, Zn, Ga}$; $0 \leq x, y, a, f \leq 1$; $0 \leq z; n, m \leq 1$) and which operates in the 2.5-4.3 V range with a voltage plateau located between the 2

values.

IT 7782-42-5, Graphite, uses
(as electronic conductor in **battery cathode**)
RN 7782-42-5 HCA
CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

IT 7440-44-0, Carbon, uses
(coating on **battery cathode** surface)
RN 7440-44-0 HCA
CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

IT 12031-95-7, Lithium titanium oxide (
Li₄Ti₅O₁₂)
(in anode in combination with **cathode** consisting of
mixed oxide and mixed phosphate)
RN 12031-95-7 HCA
CN Lithium titanium oxide (Li₄Ti₅O₁₂) (9CI) (CA INDEX NAME)

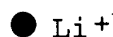
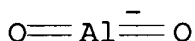
Component	Ratio	Component Registry Number
=====	=====	=====
O	12	17778-80-2
Ti	5	7440-32-6
Li	4	7439-93-2

IT 12190-79-3, Lithium cobalt oxide (**LiCoO₂**)
(in **battery cathodes**)
RN 12190-79-3 HCA
CN Cobalt lithium oxide (CoLiO₂) (9CI) (CA INDEX NAME)

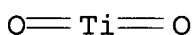
Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IT 1344-28-1, Alumina, uses 12003-67-7,
Lithium aluminate (**LiAlO₂**) 13463-67-7,
Titania, uses
(in **battery electrolyte**)
RN 1344-28-1 HCA

CN Aluminum oxide (Al₂O₃) (8CI, 9CI) (CA INDEX NAME)
 *** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
 RN 12003-67-7 HCA
 CN Aluminate (AlO₂⁻), lithium (9CI) (CA INDEX NAME)



RN 13463-67-7 HCA
 CN Titanium oxide (TiO₂) (8CI, 9CI) (CA INDEX NAME)



IC ICM H01M004-00
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST **battery cathode** compn
 IT **Carbon black**, uses
 (as electronic conductor in **battery cathode**)
 IT **Battery cathodes**
 (compn. and use of)
 IT **Battery electrolytes**
 (for **cathode** consisting of mixed oxide and mixed
 phosphate)
 IT Polyesters, uses
 Polyolefins
 (in **battery electrolyte**)
 IT Primary **batteries**
 Secondary **batteries**
 (with **cathode** consisting of mixed oxide and mixed
 phosphate)
 IT Lithium alloy, base
 (anode in combination with **cathode** consisting of mixed
 oxide and mixed phosphate)
 IT 72785-69-4
 (anode in combination with **cathode** consisting of mixed
 oxide and mixed phosphate)
 IT 7429-90-5, Aluminum, uses
 (as current collector in **battery cathode**)
 IT **7782-42-5, Graphite**, uses
 (as electronic conductor in **battery cathode**)
 IT 96-48-0, γ-Butyrolactone 872-50-4, N-Methylpyrrolidone, uses
 7440-44-0, Carbon, uses

- (coating on **battery cathode** surface)
- IT 7439-93-2, Lithium, uses
(for anode in combination with **cathode** consisting of mixed oxide and mixed phosphate)
- IT 12022-46-7, Iron lithium oxide (LiFeO_2) 12031-95-7, Lithium **titanium oxide** ($\text{Li}_4\text{Ti}_5\text{O}_{12}$)
166187-76-4, Lithium manganese oxide ($\text{Li}_2\text{Mn}_2\text{O}_4$)
(in anode in combination with **cathode** consisting of mixed oxide and mixed phosphate)
- IT 12057-17-9, Lithium manganese oxide (LiMn_2O_4) 12190-79-3, Lithium cobalt oxide (LiCoO_2) 15365-14-7, Iron lithium phosphate (LiFePO_4)
(in **battery cathodes**)
- IT 1344-28-1, Alumina, uses 7439-93-2D, Lithium, salts 7631-86-9, Silica, uses 12003-67-7, Lithium aluminate (LiAlO_2) 13463-67-7, Titania
, uses
(in **battery electrolyte**)

L60 ANSWER 10 OF 16 HCA COPYRIGHT 2006 ACS on STN

137:22389 Carbon-coated spinel-type **$\text{Li}_4\text{Ti}_5\text{O}_{12}$** and metal-contg. **$\text{Li}_4\text{Ti}_5\text{O}_{12}$** compositions as anodes for electrochemical generators. Zaghib, Karim (Hydro-Quebec, Can.; Gauthier, Michel; Brochu, Fernand; Guerfi, Abdelbast; Masse, Monique; Armand, Michel).
PCT Int. Appl. WO 2002046101 A2 20020613, 59 pp.
DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (French). CODEN: PIXXD2. APPLICATION: WO 2001-CA1714 20011203. PRIORITY: CA 2000-2327370 20001205.

- AB The synthesis of **$\text{Li}_4\text{Ti}_5\text{O}_{12}$** , $\text{Li}_4\text{ZbTi}_{(5-b)}\text{O}_{12}$, or $\text{Li}_{(4-a)}\text{ZaTi}_5\text{O}_{12}$, preferably of spinel structure, are described, in which $b = 0-0.50$; $a = 0-0.33$; and Z is a metal selected from Mg, Nb, Al, Zr, Ni, and Co. The carbon-coated spinel particles are prep'd. by heating a dispersion of a ternary mixt. of $\text{TiO}_x\text{-Li}_2\text{Y-carbon}$ ($x = 1-2$; $z = 1-2$; $Y = \text{CO}_3, \text{OH}, \text{O}, \text{and TiO}_3$). These spinel particles, when coated with 0.1-10 wt.% carbon (most preferably apprx. 2 wt.% carbon), exhibit particularly interesting electrochem. properties and can be used as anodes in electrochem. generators, with **cathodes** of type **LiFePO_4** , **LiCoO_2** , **LiMn_2O_4** , and **LiNiO_2** .
- IT 12190-79-3P, Cobalt lithium oxide (CoLiO_2)
(**cathode**; carbon-coated spinel-type **$\text{Li}_4\text{Ti}_5\text{O}_{12}$**)

and metal-contg. **Li4Ti5O12** compns. as anodes for electrochem. generators)

RN 12190-79-3 HCA

CN Cobalt lithium oxide (CoLiO2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

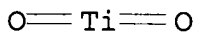
IT 13463-67-7, Titanium oxide (TiO2

), reactions

(reaction of; in prepn. of carbon-coated spinel-type **Li4Ti5O12** and metal-contg. **Li4Ti5O12** compns. as anodes for electrochem. generators)

RN 13463-67-7 HCA

CN Titanium oxide (TiO2) (8CI, 9CI) (CA INDEX NAME)



IT 12031-95-7P, Lithium titanium oxide (**Li4Ti5O12**)

(spinel, anodes; carbon-coated spinel-type **Li4Ti5O12** and metal-contg. **Li4Ti5O12** compns. as anodes for electrochem. generators)

RN 12031-95-7 HCA

CN Lithium titanium oxide (Li4Ti5O12) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	12	17778-80-2
Ti	5	7440-32-6
Li	4	7439-93-2

IC ICM C01G023-00

ICS H01M004-48

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49

ST spinel lithium titanate **battery** anode; metal substituted
lithium titanate **battery** anode

IT **Battery** anodes

Battery cathodes

Spinel-type crystals

(carbon-coated spinel-type **Li4Ti5O12** and metal-contg.

- Li4Ti5O12** compns. as anodes for electrochem. generators)
- IT Electric generators
(electrochem.; carbon-coated spinel-type **Li4Ti5O12** and metal-contg. **Li4Ti5O12** compns. as anodes for electrochem. generators)
- IT **Carbon black**, processes
(metal oxide encapsulation with; in prepn. of carbon-coated spinel-type **Li4Ti5O12** and metal-contg. **Li4Ti5O12** compns. as anodes for electrochem. generators)
- IT 12031-65-1P, Lithium nickel oxide (LiNiO_2) 12057-17-9P, Lithium manganese oxide (LiMn_2O_4) **12190-79-3P**, Cobalt lithium oxide (CoLiO_2) 15365-14-7P, Iron lithium phosphate ($\text{FeLi}(\text{PO}_4)$)
(**cathode**; carbon-coated spinel-type **Li4Ti5O12** and metal-contg. **Li4Ti5O12** compns. as anodes for electrochem. generators)
- IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 616-38-6, Dimethyl carbonate 2832-49-7, Sulfamide, tetraethyl- 14283-07-9, Lithium tetrafluoroborate 90076-65-6, Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt
(electrolyte **contg.**; prepn. of carbon-coated spinel-type **Li4Ti5O12** and metal-contg. **Li4Ti5O12** compns. as anodes for electrochem. generators)
- IT 136904-11-5, Unithox 750
(in prepn. of carbon-coated spinel-type **Li4Ti5O12** and metal-contg. **Li4Ti5O12** compns. as anodes for electrochem. generators)
- IT 554-13-2, Lithium carbonate (Li_2CO_3) 1317-70-0, Anatase **13463-67-7, Titanium oxide (TiO_2)**, reactions
(reaction of; in prepn. of carbon-coated spinel-type **Li4Ti5O12** and metal-contg. **Li4Ti5O12** compns. as anodes for electrochem. generators)
- IT 7429-90-5DP, Aluminum, lithium titanates 7439-95-4DP, Magnesium, lithium titanates 7440-02-0DP, Nickel, lithium titanates 7440-03-1DP, Niobium, lithium titanates 7440-48-4DP, Cobalt, lithium titanates 7440-67-7DP, Zirconium, lithium titanates **12031-95-7P, Lithium titanium oxide (Li4Ti5O12)**
(spinel, anodes; carbon-coated spinel-type **Li4Ti5O12** and metal-contg. **Li4Ti5O12** compns. as anodes for electrochem. generators)

L60 ANSWER 11 OF 16 HCA COPYRIGHT 2006 ACS on STN

136:186618 Secondary nonaqueous electrolyte lithium ion **battery**
. Uemura, Ryuzo; Takekawa, Toshihiro; Munakata, Fumio; Osawa, Yasuhiko (Nissan Motor Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2002050401 A2 **20020215**, 10 pp. (Japanese). CODEN:

JKXXAF. APPLICATION: JP 2000-232948 20000801.

AB The **battery** has a **layer structured** cryst. LiMO_2 ($M = \text{Mn}$ based metal) **cathode** and an anode having an irreversible capacity 3-50% the capacity of the **cathode** oxide.

IT **200938-46-1D**, Lithium manganese nickel oxide ($\text{Li}_2\text{Mn}_{1.5}\text{Ni}_{0.5}\text{O}_4$), oxygen deficient (compns. of lithium manganese oxides for **cathodes** in secondary lithium **batteries**)

RN 200938-46-1 HCA

CN Lithium manganese nickel oxide ($\text{Li}_2\text{Mn}_{1.5}\text{Ni}_{0.5}\text{O}_4$) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	4	17778-80-2
Ni	0.5	7440-02-0
Mn	1.5	7439-96-5
Li	2	7439-93-2

IC ICM H01M010-40
ICS H01M004-02; H01M004-58

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary lithium **battery** anode irreversible capacity;
lithium manganese oxide compn **battery cathode**

IT **Carbonaceous** materials (technological products)
(anodes with controlled irreversible capacity for secondary lithium **batteries**)

IT **Battery cathodes**
(compns. of lithium manganese oxides for **cathodes** in secondary lithium **batteries**)

IT **Secondary batteries**
(lithium; anodes with controlled irreversible capacity for secondary lithium **batteries** with substituted lithium manganese oxide **cathodes**)

IT 118819-08-2, Cobalt lithium manganese oxide ($\text{Co}_{0.5}\text{LiMn}_{0.5}\text{O}_2$)
118819-08-2D, Cobalt lithium manganese oxide ($\text{Co}_{0.5}\text{LiMn}_{0.5}\text{O}_2$), oxygen deficient 161580-34-3D, Chromium lithium manganese oxide ($\text{Cr}_{0.5}\text{Li}_2\text{Mn}_{1.5}\text{O}_4$), oxygen deficient **200938-46-1D**, Lithium manganese nickel oxide ($\text{Li}_2\text{Mn}_{1.5}\text{Ni}_{0.5}\text{O}_4$), oxygen deficient 206552-67-2D, Aluminum lithium manganese oxide ($\text{Al}_{0.25}\text{LiMn}_{0.75}\text{O}_2$), oxygen deficient 248581-94-4D, Cobalt lithium manganese oxide ($\text{Co}_{0.5}\text{Li}_2\text{Mn}_{1.5}\text{O}_4$), oxygen deficient 251906-03-3D, Lithium manganese vanadium oxide ($\text{LiMn}_{0.75}\text{VO}_{0.25}\text{O}_2$), oxygen deficient 251906-05-5D, Lithium manganese **titanium oxide** ($\text{LiMn}_{0.75}\text{Ti}_{0.25}\text{O}_2$), oxygen deficient 251906-09-9D, Lithium manganese niobium oxide ($\text{LiMn}_{0.75}\text{Nb}_{0.25}\text{O}_2$), oxygen deficient

399507-64-3D, Cobalt lithium manganese oxide ($\text{Co}_{0.33}\text{LiMn}_{0.67}\text{O}_2$), oxygen deficient 399507-65-4D, Iron lithium manganese oxide ($\text{Fe}_{0.33}\text{LiMn}_{0.67}\text{O}_2$), oxygen deficient 399507-66-5D, Gallium lithium manganese oxide ($\text{Ga}_{0.25}\text{LiMn}_{0.75}\text{O}_2$), oxygen deficient 399507-67-6D, Indium lithium manganese oxide ($\text{In}_{0.25}\text{LiMn}_{0.75}\text{O}_2$), oxygen deficient 399507-68-7D, Lithium manganese zirconium oxide ($\text{LiMn}_{0.75}\text{Zr}_{0.25}\text{O}_2$), oxygen deficient 399507-69-8D, Iron lithium manganese oxide ($\text{Fe}_{0.12}\text{LiMn}_{0.88}\text{O}_2$), oxygen deficient 399507-70-1D, Lithium manganese tantalum oxide ($\text{LiMn}_{0.75}\text{Ta}_{0.25}\text{O}_2$), oxygen deficient (compns. of lithium manganese oxides for **cathodes** in secondary lithium **batteries**)

L60 ANSWER 12 OF 16 HCA COPYRIGHT 2006 ACS on STN

136:137422 Rechargeable lithium **battery**. Uemura, Ryuzo; Takekawa, Toshihiro; Munakata, Fumio (Nissan Motor Co., Ltd., Japan). U.S. Pat. Appl. Publ. US 20020012830 A1 20020131; 14 pp. (English). CODEN: USXXCO. APPLICATION: US 2001-917745 20010731. PRIORITY: JP 2000-230492 20000731.

AB A rechargeable lithium **battery** includes a neg. electrode material having a total irreversible capacity of 45% or less of a total capacity of a **pos. electrode** material. By adjusting the irreversible capacity of the neg. electrode material in a wide range, a cryst. structure of the **pos. electrode** material during charge-discharge is stably maintained, and cyclic resistance of the rechargeable lithium **battery** is improved. Moreover, the rechargeable lithium **battery** having a large capacity and high cyclic resistance at high temp. can be provided by the use of Li deficient type lithium manganese oxide of a **layer structure** as a **pos. electrode** material.

IT 7440-44-0, Carbon, uses 356786-67-9D, Lithium manganese nickel oxide $\text{Li}_{0.83}\text{Mn}_{0.75}\text{Ni}_{0.25}\text{O}_2$, O-deficient (rechargeable lithium **battery** with improved cyclic resistance)

RN 7440-44-0 HCA

CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

RN 356786-67-9 HCA

CN Lithium manganese nickel oxide ($\text{Li}_{0.83}\text{Mn}_{0.75}\text{Ni}_{0.25}\text{O}_2$) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2

Ni	0.25	7440-02-0
Mn	0.75	7439-96-5
Li	0.83	7439-93-2

IC ICM H01M004-48
ICS H01M004-52; H01M004-50

INCL 429060000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST **battery** lithium rechargeable; lithium manganese oxide
cathode rechargeable **battery**

IT Secondary **batteries**
(lithium; rechargeable lithium **battery** with improved cyclic resistance)

IT **Battery cathodes**
(rechargeable lithium **battery** with improved cyclic resistance)

IT Nitrides
Oxides (inorganic), uses
(rechargeable lithium **battery** with improved cyclic resistance)

IT **7440-44-0**, Carbon, uses 356786-63-5D, Cobalt lithium manganese oxide $\text{Co}_{0.5}\text{Li}_{0.67}\text{Mn}_{0.5}\text{O}_2$, O-deficient 356786-64-6D, Cobalt lithium manganese oxide $\text{Co}_{0.5}\text{Li}_{0.83}\text{Mn}_{0.05}\text{O}_2$, O-deficient 356786-65-7D, Cobalt lithium manganese oxide $\text{Co}_{0.5}\text{Li}_{0.97}\text{Mn}_{0.5}\text{O}_2$, O-deficient 356786-66-8D, Cobalt lithium manganese oxide $\text{Co}_{0.25}\text{Li}_{0.75}\text{Mn}_{0.75}\text{O}_2$, O-deficient **356786-67-9D**, Lithium manganese nickel oxide $\text{Li}_{0.83}\text{Mn}_{0.75}\text{Ni}_{0.25}\text{O}_2$, O-deficient 356786-68-0D, Iron lithium manganese oxide $\text{Fe}_{0.33}\text{Li}_{0.83}\text{Mn}_{0.67}\text{O}_2$, O-deficient 356786-69-1D, Aluminum lithium manganese oxide $\text{Al}_{0.25}\text{Li}_{0.83}\text{Mn}_{0.75}\text{O}_2$, O-deficient 356786-70-4D, Chromium lithium manganese oxide $\text{Cr}_{0.25}\text{Li}_{0.83}\text{Mn}_{0.75}\text{O}_2$, O-deficient 356786-71-5D, Gallium lithium manganese oxide $\text{Ga}_{0.25}\text{Li}_{0.83}\text{Mn}_{0.75}\text{O}_2$, O-deficient 356786-72-6D, Indium lithium manganese oxide $\text{In}_{0.25}\text{Li}_{0.83}\text{Mn}_{0.75}\text{O}_2$, O-deficient 356786-74-8D, Lithium manganese vanadium oxide $\text{Li}_{0.83}\text{Mn}_{0.75}\text{V}_{0.25}\text{O}_2$, O-deficient 356786-75-9D, Iron lithium manganese oxide ($\text{Fe}_{0.12}\text{Li}_{0.75}\text{Mn}_{0.88}\text{O}_2$), O-deficient 356786-76-0D, Lithium manganese niobium oxide $\text{Li}_{0.83}\text{Mn}_{0.75}\text{Nb}_{0.25}\text{O}_2$, O-deficient 356786-77-1D, Lithium manganese tantalum oxide $\text{Li}_{0.83}\text{Mn}_{0.75}\text{Ta}_{0.25}\text{O}_2$, O-deficient 356786-78-2D, Lithium manganese **titanium oxide** $\text{Li}_{0.83}\text{Mn}_{0.75}\text{Ti}_{0.25}\text{O}_2$, O-deficient 393583-27-2D, Lithium manganese zinc oxide ($\text{Li}_{0.83}\text{Mn}_{0.75}\text{Zn}_{0.25}\text{O}_2$), O-deficient (rechargeable lithium **battery** with improved cyclic resistance)

L60 ANSWER 13 OF 16 HCA COPYRIGHT 2006 ACS on STN

136:9101 Fabrication method for lithium secondary battery with polymer electrolyte prepared by spray method. Yun, Kyung Suk; Cho, Byung Won; Cho, Won Il; Kim, Hyung Sun; Kim, Un Seok (Korea Institute of

Science and Technology, S. Korea). PCT Int. Appl. WO 2001091222 A1 20011129, 34 pp. DESIGNATED STATES: W: JP, KR, US.

(English). CODEN: PIXXD2. APPLICATION: WO 2000-KR515 20000522.

AB The present invention provides a lithium secondary battery and its fabrication method. More particularly, the present invention provides a lithium secondary battery comprising a porous polymer electrolyte and its fabrication method, wherein the polymer electrolyte is fabricated by the following process: (a) dissolving at least one polymer with plasticizers and org. electrolyte solvents to obtain at least one polymeric electrolyte soln.; (b) adding the obtained polymeric electrolyte soln. to a barrel of a spray machine, and (c) spraying the polymeric electrolyte soln. onto a substrate using a nozzle to form a porous polymer electrolyte film. The lithium secondary battery of the present invention has advantages of better adhesion with electrodes, good mech. strength, better performance at low and high temps., and better compatibility with org. electrolytes of a lithium secondary battery.

IT 7782-42-5, Graphite, uses 12190-79-3, Cobalt lithium oxide colio2

(fabrication method for lithium secondary battery with polymer electrolyte prepd. by spray method)

RN 7782-42-5 HCA

CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

RN 12190-79-3 HCA

CN Cobalt lithium oxide (CoLiO2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IT 1309-48-4, Magnesia, uses 1344-28-1, Alumina, uses 12003-67-7, Aluminum lithium oxide allio2 13463-67-7, Titania, uses

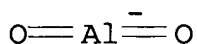
(filling agent; fabrication method for lithium secondary battery with polymer electrolyte prepd. by spray method)

RN 1309-48-4 HCA

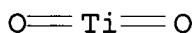
CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)

Mg=O

RN 1344-28-1 HCA
 CN Aluminum oxide (Al₂O₃) (8CI, 9CI) (CA INDEX NAME)
 *** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
 RN 12003-67-7 HCA
 CN Aluminate (AlO₂⁻), lithium (9CI) (CA INDEX NAME)



RN 13463-67-7 HCA
 CN Titanium oxide (TiO₂) (8CI, 9CI) (CA INDEX NAME)



IC ICM H01M010-38
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 38
 IT Battery electrolytes
 Lamination
 Plasticizers
 Polymer electrolytes
 (fabrication method for lithium secondary battery with polymer
 electrolyte prep'd. by spray method)
 IT **Coating process**
 (spray; fabrication method for lithium secondary battery with
 polymer electrolyte prep'd. by spray method)
 IT 79-20-9, Methyl acetate 105-37-3, Ethyl propionate 109-99-9,
 Thf, uses 141-78-6, Ethyl acetate, uses 554-12-1, Methyl
 propionate **7782-42-5, Graphite**, uses
 7791-03-9, Lithium perchlorate 9002-86-2, Pvc 9002-88-4,
 Polyethylene 9003-07-0, Polypropylene 9003-20-7, Polyvinyl
 acetate 9004-34-6, Cellulose, uses 9004-35-7, Cellulose acetate
 9004-36-8 9004-39-1, Cellulose acetate propionate 9010-76-8,
 Acrylonitrile-vinylidene chloride copolymer 9010-88-2, Ethyl
 acrylate-methylmethacrylate copolymer 9011-14-7, Pmma 9011-17-0,
 Hexafluoropropylene-vinylidene fluoride copolymer **12190-79-3**
 , Cobalt lithium oxide colio2 14283-07-9, Lithium
 tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate
 24937-79-9, PvdF 24968-79-4, Acrylonitrile-methyl acrylate
 copolymer 24980-34-5, Polyethylenesulfide 25014-41-9,
 Polyacrylonitrile 25086-89-9, Vinyl acetate-vinyl pyrrolidone
 copolymer 25322-68-3, Peo 25322-69-4, Polypropylene oxide

25667-11-2, Polyethylenesuccinate 26913-06-4, Poly[imino(1,2-ethanediyl)] 28726-47-8, Poly(oxyethylene-oxyethylene) 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 98973-15-0, Poly[bis(2-(2-methoxyethoxyethoxy))-phosphazene]

(fabrication method for lithium secondary battery with polymer electrolyte prepd. by spray method)

IT 554-13-2, Lithium carbonate 1304-28-5, Barium oxide bao, uses **1309-48-4, Magnesia**, uses 1310-65-2, Lithium hydroxide 1313-59-3, Sodium oxide, uses **1344-28-1, Alumina**, uses 7631-86-9, Silica, uses 7789-24-4, Lithium fluoride, uses 9002-84-0, Ptfе **12003-67-7, Aluminum lithium oxide allio2** 12047-27-7, Barium **titanium oxide** batiao3, uses 12057-24-8, Lithia, uses **13463-67-7, Titania**, uses 26134-62-3, Lithium nitride

(filling agent; fabrication method for lithium secondary battery with polymer electrolyte prepd. by spray method)

L60 ANSWER 14 OF 16 HCA COPYRIGHT 2006 ACS on STN

135:198007 **Cathode** material for nonaqueous electrolyte lithium secondary **battery**. Munakata, Fumio; Fukuzawa, Tatsuhiko; Ohsawa, Yasuhiko; Tanjo, Yuuji; Mihara, Takuya; Kimura, Takashi; Sunahara, Kazuo; Suhara, Manabu (Nissan Motor Company, Limited, Japan). Eur. Pat. Appl. EP 1130665 A1 **20010905**, 15 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW. APPLICATION: EP 2001-104744 20010226. PRIORITY: JP 2000-58097 20000303.

AB A **pos. electrode** active material for a nonaq. electrolyte secondary **battery** includes at least a lithium-contg. manganese layered composite oxide represented by the general formula $Li_{1-x}Mn_{1-y}MyO_2 \cdot \psi$. The lithium-contg. manganese composite oxide is deficient in lithium with respect to the stoichiometric compn. of a **layered** crystal **structure** represented by the general formula $LiMeO_2$. Part of Mn is replaced by a substitute metal such as Co, Ni, Fe, Al, Ga, In, V, Nb, Ta, Ti, Zr, Ce or Cr.

IT **7440-44-0, Carbon**, uses **356786-67-9D**, Lithium manganese nickel oxide ($Li_{0.83}Mn_{0.75}Ni_{0.25}O_2$), O-deficient (**cathode material** for nonaq. electrolyte lithium secondary **battery**)

RN 7440-44-0 HCA

CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

RN 356786-67-9 HCA
 CN Lithium manganese nickel oxide ($\text{Li}_{0.83}\text{Mn}_{0.75}\text{Ni}_{0.25}\text{O}_2$) (9CI) (CA
 INDEX NAME)

Component	Ratio	Component Registry Number
=====+=====+=====		
O	2	17778-80-2
Ni	0.25	7440-02-0
Mn	0.75	7439-96-5
Li	0.83	7439-93-2

IC ICM H01M004-50
 ICS C01G045-02; H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST lithium **battery cathode**
 IT **Battery cathodes**
 Coprecipitation
 (cathode material for nonaq. electrolyte lithium
 secondary **battery**)
 IT Secondary **batteries**
 (lithium; cathode material for nonaq. electrolyte
 lithium secondary **battery**)
 IT Mixing
 (solid-phase; cathode material for nonaq. electrolyte
 lithium secondary **battery**)
 IT 7439-93-2, Lithium, uses **7440-44-0, Carbon**, uses
 356786-63-5D, Cobalt lithium manganese oxide ($\text{Co}_{0.5}\text{Li}_{0.67}\text{Mn}_{0.5}\text{O}_2$),
 O-deficient 356786-64-6D, Cobalt lithium manganese oxide
 ($\text{Co}_{0.5}\text{Li}_{0.83}\text{Mn}_{0.5}\text{O}_2$), O-deficient 356786-65-7D, Cobalt lithium
 manganese oxide ($\text{Co}_{0.5}\text{Li}_{0.97}\text{Mn}_{0.5}\text{O}_2$), O-deficient 356786-66-8D,
 Cobalt lithium manganese oxide ($\text{Co}_{0.25}\text{Li}_{0.75}\text{Mn}_{0.75}\text{O}_2$), O-deficient
356786-67-9D, Lithium manganese nickel oxide
 ($\text{Li}_{0.83}\text{Mn}_{0.75}\text{Ni}_{0.25}\text{O}_2$), O-deficient 356786-68-0D, Iron lithium
 manganese oxide ($\text{Fe}_{0.33}\text{Li}_{0.83}\text{Mn}_{0.67}\text{O}_2$), O-deficient 356786-69-1D,
 Aluminum lithium manganese oxide ($\text{Al}_{0.25}\text{Li}_{0.83}\text{Mn}_{0.75}\text{O}_2$), O-deficient
 356786-70-4D, Chromium lithium manganese oxide
 ($\text{Cr}_{0.25}\text{Li}_{0.83}\text{Mn}_{0.75}\text{O}_2$), O-deficient 356786-71-5D, Gallium lithium
 manganese oxide ($\text{Ga}_{0.25}\text{Li}_{0.83}\text{Mn}_{0.75}\text{O}_2$), O-deficient 356786-72-6D,
 Indium lithium manganese oxide ($\text{In}_{0.25}\text{Li}_{0.83}\text{Mn}_{0.75}\text{O}_2$), O-deficient
 356786-73-7D, Lithium manganese zirconium oxide
 ($\text{Li}_{0.83}\text{Mn}_{0.75}\text{Zr}_{0.25}\text{O}_2$), O-deficient 356786-74-8D, Lithium
 manganese vanadium oxide ($\text{Li}_{0.83}\text{Mn}_{0.75}\text{V}_{0.25}\text{O}_2$), O-deficient
 356786-75-9D, Iron lithium manganese oxide ($\text{Fe}_{0.12}\text{Li}_{0.75}\text{Mn}_{0.88}\text{O}_2$),
 O-deficient 356786-76-0D, Lithium manganese niobium oxide
 ($\text{Li}_{0.83}\text{Mn}_{0.75}\text{Nb}_{0.25}\text{O}_2$), O-deficient 356786-77-1D, Lithium
 manganese tantalum oxide ($\text{Li}_{0.83}\text{Mn}_{0.75}\text{Ta}_{0.25}\text{O}_2$), O-deficient
 356786-78-2D, Lithium manganese **titanium oxide**

(Li_{0.83}Mn_{0.75}Ti_{0.25}O₂), O-deficient
 (cathode material for nonaq. electrolyte
 lithium secondary battery)

L60 ANSWER 15 OF 16 HCA COPYRIGHT 2006 ACS on STN

130:18278 Producing electrode sheet with **multilayer** structure
 by simultaneous **multilayer** coating. Fukumura, Kenichi;
 Ishiyama, Masashi; Ishizuka, Seiji (Fuji Photo Film Co., Ltd.,
 Japan). U.S. US 5834052 A 19981110, 10 pp. (English).
 CODEN: USXXAM. APPLICATION: US 1996-759715 19961206. PRIORITY: JP
 1995-321508 19951211.

AB A method for producing an electrode sheet having a
multilayer structure is disclosed, wherein two or more
 layers for an electrode sheet are simultaneously coated with a
 coating soln. by using a coater.

IT 1344-28-1, Alumina, uses
 (component of mixt. for protective layer in simultaneous
multilayer coating)

RN 1344-28-1 HCA

CN Aluminum oxide (Al₂O₃) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

IT 7782-42-5, Graphite, uses
 (electroconducting component in mixt. for neg. electrode material
 for simultaneous **multilayer** coating)

RN 7782-42-5 HCA

CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

IT 12190-79-3, Lithium cobalt oxide LiCoO₂
 (pos. electrode active material in
 simultaneous **multilayer** coating)

RN 12190-79-3 HCA

CN Cobalt lithium oxide (CoLiO₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IT 13463-67-7, Titanium oxide, uses
 (pos. electrode material in simultaneous
multilayer coating)

RN 13463-67-7 HCA

CN Titanium oxide (TiO₂) (8CI, 9CI) (CA INDEX NAME)

O=Ti=O

IC ICM B05D005-12
INCL 427058000
CC 72-2 (Electrochemistry)
Section cross-reference(s): 52
ST electrode simultaneously **multilayer** coating coater
extrusion; secondary **battery** electrode simultaneously
multilayer coating
IT Fluoropolymers, uses
(component of mixt. for simultaneous **multilayer**
coating)
IT **Carbon black**, uses
(elec. conductive agent in simultaneous **multilayer**
coating)
IT Vacuum chambers
(in device for simultaneous **multilayer** coating of
electrodes)
IT **Secondary batteries**
(lithium; producing electrode sheet with **multilayer**
structure by simultaneous **multilayer** coating for)
IT Thickness
(of layers in simultaneous **multilayer** coating of
electrodes)
IT Viscosity
(of mixts. for simultaneous **multilayer** coating of
electrodes)
IT Extrusion, nonbiological
Slurries
(of viscous mixts. of materials in simultaneous
multilayer coating of electrodes)
IT **Coating materials**
Multilayers
(producing electrode sheet with **multilayer** structure by
simultaneous **multilayer** coating)
IT Alloys, uses
(simultaneous **multilayer** coating on)
IT Electrodes
(with **multilayer** structure by simultaneous
multilayer coating)
IT 216002-15-2, Nipol 1820B
(binder in mixt. for simultaneous **multilayer** coating)
IT 1344-28-1, **Alumina**, uses
(component of mixt. for protective layer in simultaneous
multilayer coating)
IT 9004-32-4 24937-79-9, PVDF

(component of mixt. for simultaneous **multilayer** coating)

- IT 7782-42-5, **Graphite**, uses
(electroconducting component in mixt. for neg. electrode material for simultaneous **multilayer** coating)
- IT 96-49-1, Ethylene carbonate 105-37-3, Ethyl propionate 105-58-8, Diethyl carbonate 616-38-6, Dimethyl carbonate 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate (electrolyte for **battery** with electrode sheet with **multilayer** structure, contg.)
- IT 215917-54-7
(neg. electrode material in mixt. for simultaneous **multilayer** coating)
- IT 12190-79-3, Lithium cobalt oxide **LiCoO₂**
(**pos. electrode** active material in simultaneous **multilayer** coating)
- IT 1314-23-4, Zirconium oxide, uses 13463-67-7, **Titanium oxide**, uses
(**pos. electrode** material in simultaneous **multilayer** coating)
- IT 7429-90-5, Aluminum, uses 7440-02-0, Nickel, uses 7440-32-6, Titanium, uses 7440-50-8, Copper, uses 12597-68-1, Stainless steel, uses
(simultaneous **multilayer** coating on)

L60 ANSWER 16 OF 16 HCA COPYRIGHT 2006 ACS on STN

121:259650 Secondary lithium **batteries** with improved binders for electrodes. Koga, Keiji; Suzuki, Hisashi; Kaya, Masanori; Arai, Hitoshi; Kagotani, Tsuneo; Miyaki, Yousuke (TDK Corp., Japan). PCT Int. Appl. WO 9415374 A1 19940707, 54 pp. DESIGNATED STATES: W: US; RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (Japanese). CODEN: PIXXD2. APPLICATION: WO 1993-JP1883 19931224. PRIORITY: JP 1992-359450 19921225.

- AB The **batteries** use **carbonaceous** anodes and **cathodes** of a Li intercalating layer **structured** compd. or a **carbonaceous** material, where the electrode active materials are bonded to current collectors by a binder contg. a crosslinked polymer, or the electrodes are obtained by applying an active mass mixed with a polymer binder contg. a fluoropolymer on the collectors and curing the binder by a radiation beam. These **batteries** have long cycle life.
- IT 12190-79-3, Lithium cobalt oxide (**LiCoO₂**)
(**cathode**; secondary lithium **batteries** with improved binders for electrodes)
- RN 12190-79-3 HCA
- CN Cobalt lithium oxide (**CoLiO₂**) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IT 1309-48-4, **Magnesia**, uses
(electrode component; secondary lithium **batteries** with
improved binders for electrodes)

RN 1309-48-4 HCA

CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)

Mg=O

IT 7782-42-5, **Graphite**, uses
(lithium intercalating anode; secondary lithium **batteries**
with improved binders for electrodes)

RN 7782-42-5 HCA

CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

IC ICM H01M004-62

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38

ST lithium secondary **battery** electrode binder

IT Binding materials
(secondary lithium **batteries** with improved binders for
electrodes)

IT Electrodes
(**battery**, secondary lithium **batteries** with
improved binders for electrodes)

IT Rubber, synthetic
(hexafluoropropene-tetrafluoroethylene-vinylidene fluoride,
polyamine crosslinked binder Dai-el DPA 351; secondary lithium
batteries with improved binders for electrodes)

IT Amines, uses
(poly-, crosslinking agent; secondary lithium **batteries**
with improved binders for electrodes)

IT 101-37-1, Triallylcyanurate 9011-17-0 15625-89-5, Aronix M 309
17832-16-5 24937-79-9
(binder; secondary lithium **batteries** with improved
binders for electrodes)

IT 12190-79-3, Lithium cobalt oxide (LiCoO₂)
(**cathode**; secondary lithium **batteries** with

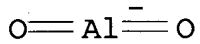
- improved binders for electrodes)
- IT 158723-68-3
(crosslinked binder; secondary lithium **batteries** with improved binders for electrodes)
- IT 1305-62-0, Calcium hydroxide, uses 1309-48-4, **Magnesia**, uses
(electrode component; secondary lithium **batteries** with improved binders for electrodes)
- IT 7782-42-5, **Graphite**, uses
(lithium intercalating anode; secondary lithium **batteries** with improved binders for electrodes)

=> D L61 1-15 CBIB ABS HITSTR HITIND

- L61 ANSWER 1 OF 15 HCA COPYRIGHT 2006 ACS on STN
141:57109 **Cathode** composition for rechargeable lithium **battery**. Le, Dinh Ba (3M Innovative Properties Company, USA). U.S. Pat. Appl. Publ. US 2004121234 A1 20040624, 16 pp. (English). CODEN: USXXCO. APPLICATION: US 2002-328563 20021223.
- AB A **cathode** compn. consists essentially of (a) at least one non-fully delithiatable **cathode** active material; and (b) at least one electrochem. inactive metal oxide; the **cathode** active material and the metal oxide being present only as sep. phases that have essentially no chem. bonding between them.
- IT 1309-48-4, **Magnesia**, uses 1344-28-1, **Alumina**, uses 12003-67-7, Aluminum lithium oxide **allio2** 12190-79-3, Cobalt lithium oxide **colio2** 13463-67-7, **Titania**, uses 152991-98-5, Aluminum lithium nickel oxide 162684-16-4, Lithium manganese nickel oxide
(**cathode** compn. for rechargeable lithium **battery**)
- RN 1309-48-4 HCA
CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)

Mg=O

- RN 1344-28-1 HCA
CN Aluminum oxide (Al₂O₃) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
RN 12003-67-7 HCA
CN Aluminate (AlO₂⁻), lithium (9CI) (CA INDEX NAME)



● Li⁺

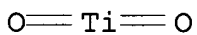
RN 12190-79-3 HCA

CN Cobalt lithium oxide (CoLiO₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

RN 13463-67-7 HCA

CN Titanium oxide (TiO₂) (8CI, 9CI) (CA INDEX NAME)



RN 152991-98-5 HCA

CN Aluminum lithium nickel oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Ni	x	7440-02-0
Li	x	7439-93-2
Al	x	7429-90-5

RN 162684-16-4 HCA

CN Lithium manganese nickel oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Ni	x	7440-02-0
Mn	x	7439-96-5
Li	x	7439-93-2

IC ICM H01M004-58

ICS H01M004-50; H01M004-52; H01M004-48
INCL 429231100; X42-923.195; X42-923.12; X42-923.13; X42-923.15;
X42-922.3; X42-922.4; X25-218.21
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **cathode** compn rechargeable lithium **battery**
IT **Battery cathodes**
Microparticles
(**cathode** compn. for rechargeable lithium
battery)
IT **Carbon black**, uses
(**cathode** compn. for rechargeable lithium
battery)
IT Secondary **batteries**
(lithium; **cathode** compn. for rechargeable lithium
battery)
IT 1303-86-2, Boron oxide b2o3, uses 1309-37-1, Ferric oxide, uses
1309-48-4, **Magnesia**, uses 1314-23-4, Zirconia,
uses 1344-28-1, **Alumina**, uses 7631-86-9,
Silica, uses 12003-67-7, Aluminum lithium oxide
allio2 12031-65-1, Lithium nickel oxide linio2
12162-79-7, Lithium manganese oxide limno2 **12190-79-3**,
Cobalt lithium oxide colio2 12423-04-0, Lithium vanadium oxide
liv3o8 **13463-67-7**, **Titania**, uses 18282-10-5,
Tin dioxide **152991-98-5**, Aluminum lithium nickel oxide
162684-16-4, Lithium manganese nickel oxide 227623-80-5,
Cobalt lithium manganese nickel oxide Co0.8LiMn0.1Ni0.102
346417-97-8, Cobalt lithium manganese nickel oxide
Co0.33LiMn0.33Ni0.33O2 390362-04-6, Cobalt lithium manganese
nickel oxide Co0.25LiMn0.37Ni0.37O2
(**cathode** compn. for rechargeable lithium
battery)

L61 ANSWER 2 OF 15 HCA COPYRIGHT 2006 ACS on STN

140:409706 Production of lithium-containing ceramic powders and its use
as separator in lithium **batteries**. Hennige, Volker;
Hying, Christian; Hoerpel, Gerhard (Degussa Ag, Germany). Ger.
Offen. DE 10255124 A1 20040603, 9 pp. (German). CODEN: GWXXBX.
APPLICATION: DE 2002-10255124 20021126.

AB Oxidic powders contg. lithium and silicon, aluminum, and/or
zirconium are produced by reacting a lithium compd. with a pyrogenic
oxide or a vaporizable compd. which is able to form a pyrogenic
oxide in the presence of hydrolyzing or oxidizing gases. The
lithium compd. can be lithium nitrate, lithium chloride, lithium
carbonate, lithium acetate, lithium formate, lithium azide, lithium
metal hydrides, lithium alcoholates, or lithium-org. compds. The
produced oxide powder is used as a separator in **electrochem**
. cells, esp. lithium **batteries**, lithium ion
batteries, and lithium polymer **batteries**.

IT 7782-42-5, **Graphite**, uses
 (anode; prodn. of lithium-contg. ceramic powders and its use as
 separator in lithium **batteries**)
 RN 7782-42-5 HCA
 CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

IT 12190-79-3, Cobalt lithium oxide colio2
 (**cathode**; prodn. of lithium-contg. ceramic powders and
 its use as separator in lithium **batteries**)
 RN 12190-79-3 HCA
 CN Cobalt lithium oxide (CoLiO2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IT 1344-28-1, **Alumina**, reactions
 (prodn. of lithium-contg. ceramic powders and its use as
 separator in lithium **batteries**)
 RN 1344-28-1 HCA
 CN Aluminum oxide (Al2O3) (8CI, 9CI) (CA INDEX NAME)
 *** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
 IT 37220-89-6P, Aluminum lithium oxide
 (separator; prodn. of lithium-contg. ceramic powders and its use
 as separator in lithium **batteries**)
 RN 37220-89-6 HCA
 CN Aluminum lithium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Li	x	7439-93-2
Al	x	7429-90-5

IC ICM C01G001-02
 ICS H01M002-16
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 49, 57
 ST lithium silicon aluminum zirconium oxide powder separator lithium
battery
 IT Polyoxyalkylenes, uses

- (electrolyte; prodn. of lithium-contg. ceramic powders and its use as separator in lithium **batteries**)
- IT Secondary **batteries**
(lithium; prodn. of lithium-contg. ceramic powders and its use as separator in lithium **batteries**)
- IT 7782-42-5, **Graphite**, uses
(anode; prodn. of lithium-contg. ceramic powders and its use as separator in lithium **batteries**)
- IT 12190-79-3, Cobalt lithium oxide colio2
(**cathode**; prodn. of lithium-contg. ceramic powders and its use as separator in lithium **batteries**)
- IT 7631-86-9, Silica, reactions
(colloidal; prodn. of lithium-contg. ceramic powders and its use as separator in lithium **batteries**)
- IT 7791-03-9, Lithium perchlorate 25322-68-3, Polyethylene oxide
(electrolyte; prodn. of lithium-contg. ceramic powders and its use as separator in lithium **batteries**)
- IT 78-10-4, Teos 546-89-4, Lithium acetate 554-13-2, Lithium carbonate 1314-23-4, Zirconia, reactions 1344-28-1, **Alumina**, reactions 2388-07-0, Lithium ethanolate 16853-85-3, Lithium aluminum hydride
(prodn. of lithium-contg. ceramic powders and its use as separator in lithium **batteries**)
- IT 37220-89-6P, Aluminum lithium oxide 51222-70-9P, Lithium zirconium oxide 54250-39-4P, Aluminum lithium silicon oxide 178958-56-0P, Lithium silicon oxide
(separator; prodn. of lithium-contg. ceramic powders and its use as separator in lithium **batteries**)
- L61 ANSWER 3 OF 15 HCA COPYRIGHT 2006 ACS on STN
140:273594 Lightweight secondary **battery** with high energy density. Omaru, Atsuo (Japan). U.S. Pat. Appl. Publ. US 2004058247 A1 20040325, 16 pp. (English). CODEN: USXXCO. APPLICATION: US 2003-661990 20030911. PRIORITY: JP 2002-265951 20020911.
- AB Disclosed is a **battery** with a light wt. and a high energy d. The **battery** includes an anode, having a layer of an anode active material formed on an anode substrate , a **cathode**, including a layer of a **cathode** active material formed on a **cathode** substrate , and a nonaq. liq. electrolyte. The anode substrate includes an anode resin film contg. a polymer and an anode metal layer contg. an elec. conductive metal. Since the anode resin film reduces the wt. of the anode substrate and the anode metal layer imparts electron cond. to the anode substrate, the **battery** may be reduced in wt. without detracting from **battery** characteristics to increase the energy d.
- IT 12190-79-3, Cobalt lithium oxide colio2 37220-89-6 , Aluminum lithium oxide 39302-37-9, Lithium

titanium oxide 52627-24-4, Cobalt
lithium oxide
(lightwt. secondary battery with high energy d.)

RN 12190-79-3 HCA

CN Cobalt lithium oxide (CoLiO₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

RN 37220-89-6 HCA

CN Aluminum lithium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Li	x	7439-93-2
Al	x	7429-90-5

RN 39302-37-9 HCA

CN Lithium titanium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Ti	x	7440-32-6
Li	x	7439-93-2

RN 52627-24-4 HCA

CN Cobalt lithium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Co	x	7440-48-4
Li	x	7439-93-2

IC ICM H01M004-66

ICS H01M002-16; H01M004-52; H01M004-50; H01M004-48

INCL 429234000; 429246000; 429231100; 429231300; 429221000; 429231200;
429231500; 429224000; 429223000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST **battery** lightwt secondary high energy density
IT Metals, uses
 (layer; lightwt. secondary **battery** with high energy d.)
IT **Battery** anodes
 Battery cathodes
 Elasticity
 Tensile strength
 Thermal conductivity
 (lightwt. secondary **battery** with high energy d.)
IT **Carbonaceous** materials (technological products)
 Fluoropolymers, uses
 Polyamides, uses
 Polycarbonates, uses
 Polyesters, uses
 Polyolefins
 Polythiophenylenes
 Transition metal oxides
 (lightwt. secondary **battery** with high energy d.)
IT **Secondary batteries**
 (lithium; lightwt. secondary **battery** with high energy
 d.)
IT Polymers, uses
 (nitrogen-contg.; lightwt. secondary **battery** with high
 energy d.)
IT Polymers, uses
 (sulfur-contg.; lightwt. secondary **battery** with high
 energy d.)
IT 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses 7440-02-0,
Nickel, uses 7440-32-6, Titanium, uses 7440-50-8, Copper, uses
12597-68-1, Stainless steel, uses
 (layer; lightwt. secondary **battery** with high energy d.)
IT 9002-88-4, Polyethylene 9003-07-0, Polypropylene 9004-35-7,
Cellulose acetate 11109-50-5, Sus 304 11113-67-0, Iron lithium
oxide 11126-15-1, Lithium vanadium oxide **12190-79-3**,
Cobalt lithium oxide colio2 25038-54-4, Nylon 6, uses
25038-59-9, Mylar, uses **37220-89-6**, Aluminum lithium oxide
39300-70-4, Lithium nickel oxide **39302-37-9**, Lithium
titanium oxide 39457-42-6, Lithium manganese
oxide **52627-24-4**, Cobalt lithium oxide
 (lightwt. secondary **battery** with high energy d.)

L61 ANSWER 4 OF 15 HCA COPYRIGHT 2006 ACS on STN

140:238482 Nonaqueous thin-film layer electrode **battery**.

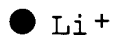
Omaru, Atsuo (Sony Corporation, Japan). U.S. Pat. Appl. Publ. US
2004048160 A1 20040311, 13 pp. (English). CODEN: USXXCO.

APPLICATION: US 2003-660807 20030911. PRIORITY: JP 2002-265952
20020911.

AB Disclosed is a **battery** which is improved in cyclic

characteristics at the same time as the **battery** capacity is increased. On an anode substrate, there is formed, by a thin film forming technique, a layer of the active material, contg. a metal that may be alloyed with lithium as an anode active material. The **battery** includes an anode contg. one or more of a metal not alloyed with lithium, an alloy or a compd. contg. the metal, and a **carbonaceous** material capable of doping/undoping lithium ions, as well as the metal that may be alloyed with lithium, a **cathode** 6 and a nonaq. liq. electrolyte 4. The metal contained in the anode as an anode active material and which may be alloyed with lithium acts to raise the **battery** capacity, while the metal not alloyed with lithium, alloys or compds. of this metal or the **carbonaceous** material suppresses deterioration of the anode attendant on the charging/discharging to improve cyclic characteristics.

IT 12003-67-7, Aluminum lithium oxide **allio2**
 12057-19-1, Lithium **titanium oxide**
 litio2 12190-79-3, Cobalt lithium oxide **colio2**
 (nonaq. thin-film layer electrode **battery**)
 RN 12003-67-7 HCA
 CN Aluminate (AlO21-), lithium (9CI) (CA INDEX NAME)



RN 12057-19-1 HCA
 CN Lithium titanium oxide (LiTiO2) (7CI, 8CI, 9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Ti	1	7440-32-6
Li	1	7439-93-2

RN 12190-79-3 HCA
 CN Cobalt lithium oxide (CoLiO2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4

Li | 1 | 7439-93-2

IC ICM H01M004-58
ICS H01M004-66; H01M004-40

INCL 429231400; 429231950; 429234000; 429245000; 429094000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST nonaq thin film layer electrode **battery**

IT Polymers, uses
(nitrogen-contg.; nonaq. thin-film layer electrode **battery**)

IT **Battery** anodes
Secondary **batteries**
(nonaq. thin-film layer electrode **battery**)

IT **Carbonaceous** materials (technological products)
(nonaq. thin-film layer electrode **battery**)

IT Fluoropolymers, uses
(nonaq. thin-film layer electrode **battery**)

IT Polyesters, uses
(nonaq. thin-film layer electrode **battery**)

IT Polyolefins
(nonaq. thin-film layer electrode **battery**)

IT Polymers, uses
(sulfur-contg.; nonaq. thin-film layer electrode **battery**
)

IT 7429-90-5, Aluminum, uses 7439-92-1, Lead, uses 7439-95-4,
Magnesium, uses 7440-21-3, Silicon, uses 7440-22-4, Silver, uses
7440-31-5, Tin, uses 7440-32-6, Titanium, uses 7440-36-0,
Antimony, uses 7440-42-8, Boron, uses 7440-43-9, Cadmium, uses
7440-55-3, Gallium, uses 7440-56-4, Germanium, uses 7440-58-6,
Hafnium, uses 7440-66-6, Zinc, uses 7440-67-7, Zirconium, uses
7440-69-9, Bismuth, uses 7440-74-6, Indium, uses
12003-67-7, Aluminum lithium oxide **allio2**
12022-46-7, Iron lithium oxide **felio2** **12031-65-1**, Lithium nickel
oxide **linio2** **12057-19-1**, Lithium **titanium**
oxide **litio2** **12162-79-7**, Lithium manganese oxide **limno2**
12162-87-7, Lithium vanadium oxide **livo2** **12190-79-3**,
Cobalt lithium oxide **colio2**
(nonaq. thin-film layer electrode **battery**)

IT 24937-79-9, PvdF
(nonaq. thin-film layer electrode **battery**)

L61 ANSWER 5 OF 15 HCA COPYRIGHT 2006 ACS on STN

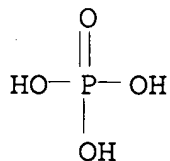
140:131168 Apparatus and method for fracture absorption layer for use in
fabrication of thin-film electrochemical devices. Benson, Martin
H.; Neudecker, Bernd J. (ITN Energym Systems, Inc., USA). U.S. Pat.
Appl. Publ. US 2004023106 A1 20040205, 25 pp. (English). CODEN:
USXXCO. APPLICATION: US 2002-210180 20020802.

AB An app. for use as a fracture absorption layer, an app. for use as

an electrochem. device, and methods of manufg. the same are disclosed. The app. and methods of the present invention may be of particular use in the manuf. of thin-film, lightwt., flexible or conformable, electrochem. devices such as **batteries**, and arrays of such devices. The present invention may provide many advantages including stunting fractures in a first electrochem. layer from propagating in a second electrochem. layer.

IT 1344-28-1, Alumina, uses 10377-52-3,
 Lithium phosphate 12003-67-7, Aluminum lithium oxide
 al1io2 12005-14-0, Aluminum lithium oxide al5lio8
 12355-58-7, Aluminum lithium oxide alli5o4
 111706-40-2, Cobalt lithium oxide CoLiO-102
 (app. and method for fracture absorption layer for use in
 fabrication of thin-film electrochem. devices)

RN 1344-28-1 HCA
 CN Aluminum oxide (Al₂O₃) (8CI, 9CI) (CA INDEX NAME)
 *** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
 RN 10377-52-3 HCA
 CN Phosphoric acid, trilithium salt (8CI, 9CI) (CA INDEX NAME)



● 3 Li

RN 12003-67-7 HCA
 CN Aluminate (AlO₂⁻), lithium (9CI) (CA INDEX NAME)



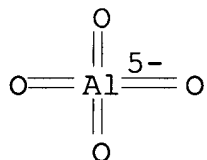
● Li⁺

RN 12005-14-0 HCA
 CN Aluminum lithium oxide (Al₅LiO₈) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====+=====+=====		

O	8	17778-80-2
Li	1	7439-93-2
Al	5	7429-90-5

RN 12355-58-7 HCA
 CN Aluminate (AlO₄⁵⁻), pentalithium, (T-4)- (9CI) (CA INDEX NAME)



●5 Li⁺

RN 111706-40-2 HCA
 CN Cobalt lithium oxide (CoLiO-102) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	1	7440-48-4
Li	0 - 1	7439-93-2

IT **7440-44-0**, Carbon, uses
 (substrate; app. and method for fracture absorption layer for use
 in fabrication of thin-film electrochem. devices)
 RN 7440-44-0 HCA
 CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

IC ICM H01M006-00
 INCL 429122000; 429126000
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 72
 ST **battery** fabrication fracture absorption layer app;
 electrochem device fabrication fracture absorption layer app
 IT Vapor deposition process
 (plasma, arc, **cathodic**; app. and method for fracture
 absorption layer for use in fabrication of thin-film electrochem.
 devices)
 IT **Coating process**

(sol-gel; app. and method for fracture absorption layer for use in fabrication of thin-film electrochem. devices)

IT Electrolytes

Primary **batteries**

(thin-film; app. and method for fracture absorption layer for use in fabrication of thin-film electrochem. devices)

IT 554-13-2, Lithium carbonate 1303-28-2, Arsenic oxide (As₂O₅) 1303-86-2, Boron oxide (B₂O₃), uses 1304-56-9, Beryllium oxide beo, uses 1306-38-3, Ceria, uses 1310-53-8, Germanium oxide (GeO₂), uses 1314-23-4, Zirconia, uses 1314-36-9, Yttria, uses 1314-56-3, Phosphorus pentoxide, uses 1327-53-3, Arsenic oxide (As₂O₃) **1344-28-1, Alumina**, uses 7429-90-5, Aluminum, uses 7439-93-2, Lithium, uses 7440-20-2, Scandium, uses 7440-21-3, Silicon, uses 7440-31-5, Tin, uses 7440-38-2, Arsenic, uses 7440-41-7, Beryllium, uses 7440-42-8, Boron, uses 7440-45-1, Cerium, uses 7440-56-4, Germanium, uses 7440-65-5, Yttrium, uses 7440-67-7, Zirconium, uses 7447-41-8, Lithium chloride, uses 7550-35-8, Lithium bromide 7631-86-9, Silica, uses 7704-34-9, Sulfur, uses 7723-14-0, Phosphorus, uses 7723-14-0D, Phosphorus, compd. 7789-24-4, Lithium fluoride, uses 7791-03-9, Lithium perchlorate 9002-84-0, Ptfе 9003-39-8, Polyvinylpyrrolidone 10043-11-5, Boron nitride (BN), uses 10377-48-7, Lithium sulfate 10377-51-2, Lithium iodide **10377-52-3**, Lithium phosphate 11118-04-0, Lithium phosphorus nitride Li₇PN₄ 11126-15-1, Lithium vanadium oxide **12003-67-7**, Aluminum lithium oxide **allio2** **12005-14-0**, Aluminum lithium oxide al5lio8 12025-11-5, Germanium lithium oxide geli4o4 12033-89-5, Silicon nitride, uses 12057-24-8, Lithia, uses 12060-08-1, Scandium oxide (Sc₂O₃) 12065-36-0, Germanium nitride ge3n4 12136-91-3, Phosphorus nitride p3n5 12169-03-8, Lithium yttrium oxide liyo2 12209-15-3, Lithium scandium oxide lisco2 12232-41-6, Beryllium lithium oxide Be₂Li₂O₃ **12355-58-7**, Aluminum lithium oxide alli5o4 12384-10-0, Lithium zirconium oxide li8zro6 12408-97-8, Boron lithium nitride BLi₃N₂ 12521-45-8, Lithium silicon nitride LiSi₂N₃ 12521-55-0, Lithium silicon nitride Li₂SiN₂ 12521-66-3, Lithium silicon nitride Li₈SiN₄ 13453-69-5, Lithium borate libo2 13453-84-4, Lithium silicon oxide li4sio4 13478-14-3, Lithium arsenate 14024-11-4, Aluminum lithium chloride ALiCl₄ 14283-07-9, Lithium tetrafluoroborate 15138-76-8, Lithium tetrafluoroaluminate 17739-47-8, Phosphorus nitride pn 19497-94-0, Aluminum lithium silicate allisio4 21324-40-3, Lithium hexafluorophosphate 24304-00-5, Aluminum nitride Aln 25322-68-3, Polyethylene oxide 25658-42-8, Zirconium nitride (ZrN) 25764-13-0, Yttrium nitride (YN) 26134-62-3, Lithium nitride li3n 30622-39-0, Lithium titanium phosphate LiTi₂(PO₄)₃ 39300-70-4, Lithium nickel oxide 39449-52-0, Lithium oxide silicate (Li₈O₂(SiO₄)) 39457-42-6, Lithium manganese oxide 56320-64-0 57349-02-7, Cerium lithium

oxide celio2 60883-88-7, Lithium phosphorus nitride LiPN2
 61027-73-4, Aluminum lithium nitride AlLi3N2 62795-18-0
 66581-07-5 66581-08-6 67181-65-1, Lithium silicon nitride
 Li5SiN3 76068-31-0 87796-15-4, Lithium scandium phosphate
 Li3Sc2(PO4)3 101993-97-9, Lithium phosphate silicate
 Li3.6(PO4)0.4(SiO4)0.6 **111706-40-2**, Cobalt lithium oxide
 CoLiO-102 113957-82-7, Lithium silicon nitride Li21Si3N11
 113957-83-8, Lithium silicon nitride Li18Si3N10 143080-25-5,
 Phosphorus nitride oxide p4n6o 170171-06-9, Aluminum lithium
 fluoride AlLiF4 184905-46-2, Lithium nitrogen phosphorus oxide
 651045-58-8, Lithium nitrogen phosphorus tin oxide
 (app. and method for fracture absorption layer for use in
 fabrication of thin-film electrochem. devices)

IT **7440-44-0**, Carbon, uses
 (substrate; app. and method for fracture absorption layer for use
 in fabrication of thin-film electrochem. devices)

L61 ANSWER 6 OF 15 HCA COPYRIGHT 2006 ACS on STN

139:152287 Polymer **cathode** containing polyethylene glycol with
 a low molecular weight and its application in lithium
batteries. Prosini, Pier Paolo; Carewska, Maria (Ente per
 le Nuove Tecnologie, l'Energia e l'Ambiente (ENEA), Italy). Ital.
 IT 1307550 B1 **20011114**, 48 pp. (Italian). CODEN: ITXXBY.
 APPLICATION: IT 1999-RM212 19990409.

AB The **cathode** contains (1) an active mass including a
 Li-contg. transition metal oxide (e.g., LiMn2O4) 20-80, (2) an elec.
 conductor (e.g., C) 1-10, a polyethylene glycol deriv. 5-60, and (4)
 a Li salt (e.g., LiClO4) 2-10 wt.%. The polyethylene glycol deriv.
 has a formula RO(CHR2CH2O)nR1 (where n = 4-90; R, R1 = independently
 H or CH3(CH2)m(CO)p- residue; m = 0-9; p = 0 or 1; R2 = H or CH3).
 The active mass contains ≥ 1 LixQzOy (where Q = Co, Mn, Ni, V,
 Fe; x = 0-2; yr = 2-5; z = 1-2). Assembly of a Li **battery**
 contg. the **cathode** and a Li foil anode involves (1) cold
 joining of the **cathode** layer and Li foil to form a
 multilayer, (2) rolling at 60-80°, and (3) cooling.

IT **7440-44-0**, Carbon, uses **12190-79-3**, Lithium cobalt
 oxide (LiCoO2)

(in polymer **cathode** for lithium **batteries**)

RN 7440-44-0 HCA

CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

RN 12190-79-3 HCA

CN Cobalt lithium oxide (CoLiO2) (9CI) (CA INDEX NAME)

Component	Ratio	Component
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		Registry Number
=====+=====+=====		
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IT 37220-89-6, Lithium aluminate
 (in polymer electrolyte for lithium **batteries**)
 RN 37220-89-6 HCA
 CN Aluminum lithium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====+=====+=====		
O	x	17778-80-2
Li	x	7439-93-2
Al	x	7429-90-5

IC ICM H01M
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST polymer **cathode** lithium **battery**
 IT Polyoxyalkylenes, uses
 (in polymer electrolyte for lithium **batteries**)
 IT Secondary **batteries**
 (lithium; polymer **cathode** contg. polyethylene glycol
 deriv. with low mol. wt. and its application in lithium
batteries)
 IT **Battery cathodes**
 (polymer **cathode** contg. polyethylene glycol deriv. with
 low mol. wt.)
 IT 7439-93-2, Lithium, uses
 (foil; anode for lithium **batteries**)
 IT 108-32-7, Propylene carbonate 7440-44-0, Carbon, uses
 7791-03-9, Lithium perchlorate (LiClO₄) 12057-17-9, Lithium
 manganese oxide (LiMn₂O₄) 12190-79-3, Lithium cobalt oxide
 (LiCoO₂) 24991-55-7, Polyethylene glycol dimethyl ether
 (in polymer **cathode** for lithium **batteries**)
 IT 25322-68-3, Polyethylene oxide 37220-89-6, Lithium
 aluminate
 (in polymer electrolyte for lithium **batteries**)

L61 ANSWER 7 OF 15 HCA COPYRIGHT 2006 ACS on STN

138:156304 **Battery** structures, self-organizing structures, and
 related methods. Chiang, Yet-Ming; Moorehead, William Douglas;
 Holman, Richard K.; Viola, Michael S.; Gozdz, Antoni S.; Loxley,
 Andrew; Riley, Gilbert N., Jr. (Massachusetts Institute of
 Technology, USA; A123 Systems). PCT Int. Appl. WO 2003012908 A2
 20030213, 138 pp. DESIGNATED STATES: W: AE, AG, AL, AM,

AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English).
CODEN: PIXXD2. APPLICATION: WO 2002-US23880 20020726. PRIORITY: US 2001-308360P 20010727; US 2001-21740 20011022.

AB An energy storage device includes a first electrode comprising a first material and a second electrode comprising a second material, at least a portion of the first and second materials forming an interpenetrating network when dispersed in an electrolyte, the electrolyte, the first material and the second material are selected so that the first and second materials exert a repelling force on each other when combined. An electrochem. device, includes a first electrode in elec. communication with a first current collector; a second electrode in elec. communication with a second current collector; and an ionically conductive medium in ionic contact with the first and second electrodes, wherein at least a portion of the first and second electrodes form an interpenetrating network and wherein at least one of the first and second electrodes comprises an electrode structure providing two or more pathways to its current collector.

IT 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses 12190-79-3, Cobalt lithium oxide colio2 13463-67-7, Titanium oxide, uses 37217-08-6, Lithium titanium oxide liti2o4
(battery structures, self-organizing structures, and related methods)

RN 7440-44-0 HCA
CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

RN 7782-42-5 HCA
CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

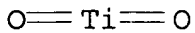
RN 12190-79-3 HCA
CN Cobalt lithium oxide (CoLiO2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
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=====+=====+=====		
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

RN 13463-67-7 HCA

CN Titanium oxide (TiO₂) (8CI, 9CI) (CA INDEX NAME)



RN 37217-08-6 HCA

CN Lithium titanium oxide (LiTi₂O₄) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====+=====+=====		
O	4	17778-80-2
Ti	2	7440-32-6
Li	1	7439-93-2

IC ICM H01M010-04

ICS H01M010-40; H01M004-04; H01M004-02; H01B009-00; G02F001-00

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 72

ST **battery** structure self organizing structure

IT Phosphazenes
((methoxyethoxy)ethoxy; **battery** structures,
self-organizing structures, and related methods)

IT **Battery** anodes

Battery cathodes

Conducting polymers

Embossing

Encapsulants

Ink-jet printing

Lithography

Polymer electrolytes

Primary **batteries**

Screen printing

(**battery** structures, self-organizing structures, and
related methods)

IT Fluoropolymers, uses

Polyamines

Polyimides, uses

Polyoxyalkylenes, uses

(**battery** structures, self-organizing structures, and
related methods)

IT Polyesters, uses

- (**battery** structures, self-organizing structures, and related methods)
- IT Polyesters, uses
 - (**battery** structures, self-organizing structures, and related methods)
- IT Glass, uses
 - (bismuth lithium borate; **battery** structures, self-organizing structures, and related methods)
- IT Polymers, uses
 - (block, lithium salt-doped, electrolyte; **battery** structures, self-organizing structures, and related methods)
- IT Electric apparatus
 - (electrochem.; **battery** structures, self-organizing structures, and related methods)
- IT Polyoxyalkylenes, uses
 - (lithium complexes, perchlorate- or triflate-contg.; **battery** structures, self-organizing structures, and related methods)
- IT Secondary **batteries**
 - (lithium; **battery** structures, self-organizing structures, and related methods)
- IT Composites
 - (nanocomposite; **battery** structures, self-organizing structures, and related methods)
- IT Printing (nonimpact)
 - (stenciling; **battery** structures, self-organizing structures, and related methods)
- IT Molding
 - (tape-casting; **battery** structures, self-organizing structures, and related methods)
- IT **Coating process**
 - (web; **battery** structures, self-organizing structures, and related methods)
- IT 7439-95-4, Magnesium, uses
 - (CoLiO₂ doped with; **battery** structures, self-organizing structures, and related methods)
- IT 7440-03-1, Niobium, uses 7440-25-7, Tantalum, uses 7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses
 - (FeLiPO₄ doped with; **battery** structures, self-organizing structures, and related methods)
- IT 7429-90-5, Aluminum, uses
 - (LiMnO₂ doped with; **battery** structures, self-organizing structures, and related methods)
- IT 68-12-2, n,n-Dimethylformamide, uses 75-11-6, Diiodomethane
 96-49-1, Ethylene carbonate 105-58-8, DiEthyl carbonate
 108-32-7, Propylene carbonate 616-38-6, DimEthyl carbonate
 627-31-6, 1,3-Diiodopropane 1307-96-6, Cobalt oxide coo, uses
 1313-13-9, Manganese oxide mno₂, uses 1313-99-1, Nickel oxide nio,

uses 1314-23-4, Zirconium oxide, uses 1314-62-1, Vanadia, uses 1317-34-6, Manganese oxide mn_2o_3 1317-35-7, Manganese oxide mn_3o_4 1335-25-7, Lead oxide 1344-43-0, Manganese oxide mn_2o_3 , uses 1345-25-1, Iron oxide feo , uses 7226-23-5 7439-93-2, Lithium, uses 7439-93-2D, Lithium, intercalation compd. 7440-21-3, Silicon, uses 7440-22-4, Silver, uses 7440-31-5, Tin, uses 7440-36-0, Antimony, uses 7440-42-8, Boron, uses **7440-44-0**, Carbon, uses 7440-56-4, Germanium, uses 7440-66-6, Zinc, uses 7440-69-9, Bismuth, uses **7782-42-5, Graphite**, uses 9002-84-0, Ptfе 9003-53-6, Polystyrene 10361-43-0, Bismuth hydroxide 12002-78-7 12031-65-1, Lithium nickel oxide $\text{li}_2\text{ni}_2\text{o}_4$ 12037-30-8, Vanadium oxide v_6o_{11} 12042-37-4, Alli 12048-27-0, Bili 12057-17-9, Lithium manganese oxide $\text{li}_2\text{mn}_2\text{o}_4$ 12057-22-6, Lizi 12057-30-6 12057-33-9 12063-07-9, Iron lithium oxide $\text{fe}_2\text{li}_2\text{o}_4$ 12162-79-7, Lithium manganese oxide $\text{li}_2\text{mn}_2\text{o}_4$ **12190-79-3**, Cobalt lithium oxide $\text{co}_2\text{li}_2\text{o}_4$ 12253-44-0 12338-02-2 12651-23-9, Titanium hydroxide **13463-67-7, Titanium oxide**, uses 14475-63-9, Zirconium hydroxide 15365-14-7, Iron lithium phosphate $\text{fe}_2\text{li}_2\text{po}_4$ 18282-10-5, Tin dioxide 21324-40-3, Lithium hexafluorophosphate 21651-19-4, Tin oxide sn_2o_3 24937-79-9, Polyvinylidene fluoride 25014-41-9, Polyacrylonitrile 25322-68-3, PEO 25322-69-4, Polypropylene oxide **37217-08-6, Lithium titanium oxide** $\text{li}_2\text{ti}_2\text{o}_4$ 39345-91-0, Lead hydroxide 50851-57-5 53262-48-9 53640-36-1 55575-96-7, Lithium silicide li_3si_4 55608-41-8 56627-44-2 61812-08-6, Lithium silicide li_2si_8 66403-10-9, Lithium boride (Li_5B_4) 67070-82-0 71012-86-7, Lithium boride (Li_7B_6) 74083-26-4 76036-33-4, Lithium silicide li_2si_7 106494-93-3, Lithium silicide li_2si_5 126213-51-2, Poly(3,4-ethylenedioxythiophene) 136511-06-3, MEEP 144419-56-7, Cobalt lithium **magnesium oxide** $\text{Co}_{0.95}\text{LiMg}_{0.05}\text{O}_2$ 496816-56-9 496816-57-0, Cobalt lithium **magnesium oxide** ($\text{Co}_{0.95}\text{Li}_{0.95}\text{Mg}_{0.05}\text{O}_{1.9}$) 496816-58-1, Iron lithium zirconium phosphate ($\text{Fe}_{0.98}\text{LiZr}_{0.02}(\text{PO}_4)$)

(**battery** structures, self-organizing structures, and related methods)

IT 76-05-1, Trifluoroacetic acid, uses 104-15-4, Toluene sulfonic acid, uses 7647-01-0, Hydrochloric acid, uses 57534-41-5, Zonyl FSN

(**battery** structures, self-organizing structures, and related methods)

IT 9002-88-4, Polyethylene 11099-11-9, Vanadium oxide 25038-59-9, Mylar, uses

(**battery** structures, self-organizing structures, and related methods)

IT 99742-70-8, Poly(o-methoxyaniline) 104934-51-2, Poly(3-octylthiophene)

(coating; **battery** structures, self-organizing

- structures, and related methods)
- IT 7440-50-8, Copper, uses
(current collector; **battery** structures, self-organizing structures, and related methods)
- IT 7791-03-9, Lithium perchlorate 33454-82-9, Lithium triflate
(electrolyte, cog. polyethylene oxide; **battery** structures, self-organizing structures, and related methods)
- IT 1303-86-2, Boron oxide b_2o_3 , uses 1304-76-3, Bismuth oxide bi_2o_3 ,
uses 1314-56-3, Phosphorus pentoxide, uses 1317-36-8, Lead oxide
 pbo , uses 7447-41-8, Lithium chloride, uses 7631-86-9, Silica,
uses 7789-24-4, Lithium fluoride, uses 10377-51-2, Lithium
iodide 12057-24-8, Lithia, uses
(glass; **battery** structures, self-organizing structures,
and related methods)
- IT 7439-93-2D, Lithium, polyethylene oxide complexes 25322-68-3D,
Peo, lithium complexes
(perchlorate- or triflate-contg.; **battery** structures,
self-organizing structures, and related methods)

L61 ANSWER 8 OF 15 HCA COPYRIGHT 2006 ACS on STN

137:143037 Method for preparing thin fiber-structured polymer web. Lee,
Wha Seop; Jo, Seong Mu; Chun, Suk Won; Choi, Sung Won (S. Korea).
U.S. Pat. Appl. Publ. US 2002100725 A1 **20020801**, 8 pp.
(English). CODEN: USXXCO. APPLICATION: US 2001-14550 20011214.
PRIORITY: KR 2001-3685 20010126.

AB Disclosed is a method for prepg. a thin fiber-structured polymer web
suitable for a high-speed and large-scale prodn. using
electrospinning. The method uses an electrospinning process to spin
a soln. contg. a polymer in a volatile solvent to obtain a thin
fiber-structured polymer web on a collector, in which case the temp.
of the polymer soln. is in the range of from 40° to the b.p.
of the solvent. The porous, thin fiber-structured polymer web thus
obtained is applicable to the isolation layer or the electrolytic
layer for lithium-ion secondary battery, lithium-metal secondary
battery or sulfur-based secondary battery, the isolation layer for
fuel cells, filter, and so forth.

- IT **7440-44-0**, Carbon, uses
(hard; method for prepg. thin fiber-structured polymer web)
- RN 7440-44-0 HCA
- CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

- IT **7782-42-5**, Graphite, uses 12057-19-1,
Lithium titanium oxide litio_2 12190-79-3
, Cobalt lithium oxide colio_2 13568-36-0, Lithium nickel
vanadium oxide linivo_4 162004-08-2, Cobalt lithium nickel

oxide colinio2

(method for prepg. thin fiber-structured polymer web)

RN 7782-42-5 HCA

CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

RN 12057-19-1 HCA

CN Lithium titanium oxide (LiTiO₂) (7CI, 8CI, 9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Ti	1	7440-32-6
Li	1	7439-93-2

RN 12190-79-3 HCA

CN Cobalt lithium oxide (CoLiO₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

RN 13568-36-0 HCA

CN Lithium nickel vanadium oxide (LiNiVO₄) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	4	17778-80-2
V	1	7440-62-2
Ni	1	7440-02-0
Li	1	7439-93-2

RN 162004-08-2 HCA

CN Cobalt lithium nickel oxide ((Co,Li,Ni)O₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	0 - 1	7440-48-4
Ni	0 - 1	7440-02-0

Li | 0 - 1 | 7439-93-2

IC ICM B01D039-08
INCL 210503000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 37, 47

ST battery electrolyte **layer** fiber **structured**
polymer web; sulfur based secondary battery fiber structured polymer
web; lithium secondary battery fiber structured polymer web; fuel
cell fiber structured polymer web; filter fiber structured polymer
web

IT **Carbonaceous** materials (technological products)
Coke
(method for prepg. thin fiber-structured polymer web)

IT **7440-44-0**, Carbon, uses
(hard; method for prepg. thin fiber-structured polymer web)

IT 1314-62-1, Vanadia, uses 1332-29-2, Tin oxide 7439-93-2,
Lithium, uses 7439-93-2D, Lithium, compd. **7782-42-5**,
Graphite, uses 12017-96-8, Chromium lithium oxide crlio2
12022-46-7, Iron lithium oxide felio2 12031-65-1, Lithium nickel
oxide linio2 12037-42-2, Vanadium oxide v6o13 12057-17-9,
Lithium manganese oxide limn2o4 **12057-19-1**, Lithium
titanium oxide litio2 12162-87-7, Lithium
vanadium oxide livo2 12169-03-8, Lithium yttrium oxide liyo2
12190-79-3, Cobalt lithium oxide colio2 12209-15-3,
Lithium scandium oxide lisco2 **13568-36-0**, Lithium nickel
vanadium oxide linivo4 **162004-08-2**, Cobalt lithium nickel
oxide colinio2 210767-01-4, Lithium manganese oxide limn2o2
(method for prepg. thin fiber-structured polymer web)

L61 ANSWER 9 OF 15 HCA COPYRIGHT 2006 ACS on STN
137:49716 Nonaqueous rechargeable **battery** for vehicles.
Takekawa, Toshihiro; Uemura, Ryuzo; Munakata, Fumio; Ohsawa,
Yasuhiko (Japan). U.S. Pat. Appl. Publ. US 2002081485 A1
20020627, 19 pp. (English). CODEN: USXXCO. APPLICATION:
US 2001-984885 20011031. PRIORITY: JP 2000-334529 20001101.

AB A nonaq. rechargeable **battery** for a vehicle contains a
pos. electrode, which has a **pos.**
electrode active material having a capacity of 120 mAh/g or
larger; and a neg. electrode, which has a neg. electrode active
material having a capacity of 280 mAh/g or larger and a reversible
rate of the capacity of 80% or more, wherein a ratio of a
pos. electrode capacity to a neg. electrode
capacity is set to 0.6 to 0.9. The nonaq. rechargeable
battery has a light wt. and a high energy d.

IT **7440-44-0**, Carbon, uses
(hard-**graphitizable**; nonaq. rechargeable
battery for vehicles)

RN 7440-44-0 HCA
 CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

IT 7782-42-5, Graphite, uses 12190-79-3,
 Cobalt lithium oxide colio2 438492-04-7, Cobalt lithium
 oxide (CoLi0.4-1.101.9-2) 438492-07-0, Aluminum lithium
 oxide (AlLi0.4-1.101.9-2)
 (nonaq. rechargeable **battery** for vehicles)

RN 7782-42-5 HCA
 CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

RN 12190-79-3 HCA
 CN Cobalt lithium oxide (CoLiO2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

RN 438492-04-7 HCA
 CN Cobalt lithium oxide (CoLi0.4-1.101.9-2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9 - 2	17778-80-2
Co	1	7440-48-4
Li	0.4 - 1.1	7439-93-2

RN 438492-07-0 HCA
 CN Aluminum lithium oxide (AlLi0.4-1.101.9-2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.9 - 2	17778-80-2
Li	0.4 - 1.1	7439-93-2
Al	1	7429-90-5

IC ICM H01M004-48

ICS H01M004-50; H01M004-52
 INCL 429060000
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST **battery** nonaq rechargeable
 IT **Battery** anodes
 Battery cathodes
 Electric vehicles
 Secondary **batteries**
 (nonaq. rechargeable **battery** for vehicles)
 IT **Carbonaceous** materials (technological products)
 Coke
 (nonaq. rechargeable **battery** for vehicles)
 IT **7440-44-0**, Carbon, uses
 (hard-**graphitizable**; nonaq. rechargeable
 battery for vehicles)
 IT **7782-42-5**, **Graphite**, uses 9002-88-4,
 Polyethylene 12031-65-1, Lithium nickel oxide LiNiO_2 12162-79-7,
 Lithium manganese oxide LiMnO_2 12190-79-3, Cobalt lithium
 oxide CoLiO_2 110665-90-2, Lithium manganese oxide $\text{Li}_{0.8}\text{MnO}_2$
 438492-04-7, Cobalt lithium oxide ($\text{CoLi}_{0.4-1.1}\text{O}_{1.9-2}$)
 438492-05-8, Chromium lithium oxide ($\text{CrLi}_{0.4-1.1}\text{O}_{1.9-2}$)
 438492-06-9, Iron lithium oxide ($\text{FeLi}_{0.4-1.1}\text{O}_{1.9-2}$)
 438492-07-0, Aluminum lithium oxide ($\text{AlLi}_{0.4-1.1}\text{O}_{1.9-2}$)
 438492-08-1, Lithium nickel oxide ($\text{Li}_{0.4-1.1}\text{NiO}_{1.9-2}$) 438492-09-2,
 Lithium manganese oxide ($\text{Li}_{0.4-1.1}\text{MnO}_{1.9-2}$) 438492-10-5, Lithium
 vanadium oxide ($\text{Li}_{0.4-1.1}\text{VO}_{1.9-2}$) 438492-11-6, Aluminum lithium
 manganese oxide ($\text{Al}_{0.05}\text{LiMn}_{1.95}\text{O}_2$)
 (nonaq. rechargeable **battery** for vehicles)

L61 ANSWER 10 OF 15 HCA COPYRIGHT 2006 ACS on STN

136:388549 Reticulated and controlled porosity **battery**
 structures. Chiang, Yet-Ming; Hellweg, Benjamin (Massachusetts
 Institute of Technology, USA). PCT Int. Appl. WO 2002043168 A2
20020530, 44 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT,
 AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK,
 DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS,
 JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK,
 MN, MW, MX, MZ, NO, NZ, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL,
 TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW; RW: AT, BE, BF, BJ,
 CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU,
 MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN:
 PIXXD2. APPLICATION: WO 2001-US48345 20011022. PRIORITY: US
 2000-242124P 20001020.

AB The effective ionic cond. in a composite structure is believed to
 decrease rapidly with vol. fraction. A system, such as a bipolar
 device or energy storage device, has structures or components in
 which the diffusion length or path that electrodes or ions must
 traverse is minimized and the interfacial area exposed to the ions

or electrons is maximized. The device includes components that can be reticulated or has a reticulated interface so that an interface area can be increased. The increased interfacial perimeter increases the available sites for reaction of ionic species. Many different reticulation patterns can be used. The aspect ratio of the reticulated features can be varied. Such bipolar devices can be fabricated by a variety of methods or procedures. A bipolar device having structures of reticulated interface can be tailored for the purposes of controlling and optimizing charge and discharge kinetics. A bipolar device having graded porosity structures can have improved transport properties because the diffusion controlling reaction kinetics can be modified. Graded porosity electrodes can be linearly or nonlinearly graded. A bipolar device having perforated structures also provides improved transport properties by removing tortuosity and reducing diffusion distance.

IT 7440-44-0, Carbon, uses 12190-79-3, Cobalt lithium oxide colio2

(reticulated and controlled porosity **battery** structures)

RN 7440-44-0 HCA

CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

RN 12190-79-3 HCA

CN Cobalt lithium oxide (CoLiO2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IC ICM H01M004-00

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST **battery** structure reticulated controlled porosity

IT Vapor deposition process

(chem.; reticulated and controlled porosity **battery** structures)

IT Sedimentation (separation)

(differential; reticulated and controlled porosity **battery** structures)

IT Polyoxyalkylenes, uses

(lithium complexes; reticulated and controlled porosity **battery** structures)

IT **Battery cathodes**

- Evaporation
- Porosity
- Screen printing
- Secondary **batteries**
- Sputtering
- Surface area
- Web materials
 - (reticulated and controlled porosity **battery** structures)
- IT Fluoropolymers, uses
 - (reticulated and controlled porosity **battery** structures)
- IT Molding
 - (tape-casting; reticulated and controlled porosity **battery** structures)
- IT Coating process
 - (web; reticulated and controlled porosity **battery** structures)
- IT 91-20-3, Naphthalene, uses
 - (pore former; reticulated and controlled porosity **battery** structures)
- IT 96-49-1, Ethylene carbonate 616-38-6, Dimethyl carbonate 7429-90-5, Aluminum, uses 7439-93-2D, Lithium, polyethylene oxide complex 7440-22-4, Silver, uses 7440-31-5, Tin, uses 7440-36-0, Antimony, uses **7440-44-0**, Carbon, uses 7440-66-6, Zinc, uses 12031-65-1, Lithium nickel oxide LiNiO_2 12057-17-9, Lithium manganese oxide LiMn_2O_4 12057-30-6 12162-79-7, Lithium manganese oxide LiMnO_2 **12190-79-3**, Cobalt lithium oxide CoLiO_2 12798-95-7 15365-14-7, Iron lithium phosphate FeLiPO_4 25322-68-3D, Peo, lithium complexes 144419-56-7, Cobalt lithium **magnesium oxide** $\text{Co}_{0.95}\text{LiMg}_{0.05}\text{O}_2$
 - (reticulated and controlled porosity **battery** structures)
- IT 1314-62-1, Vanadium pentoxide, uses 12338-02-2
 - (reticulated and controlled porosity **battery** structures)
- IT 24937-79-9, PvdF
 - (reticulated and controlled porosity **battery** structures)

L61 ANSWER 11 OF 15 HCA COPYRIGHT 2006 ACS on STN

136:21973 Nonaqueous electrolyte secondary **battery**.

Yamaguchi, Akira; Omaru, Atsuo; Nagamine, Masayuki; Hasegawa, Minoru (Sony Corp., Japan). Eur. Pat. Appl. EP 1160905 A2 **20011205**

, 38 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English).

CODEN: EPXXDW. APPLICATION: EP 2001-112471 20010522. PRIORITY: JP

2000-157116 20000526; JP 2000-200368 20000630.

AB A nonaq. electrolyte secondary **battery** comprises a **cathode** having a **cathode** active material capable of electrochem. doping/dedoping lithium, an anode having an anode active material capable of electrochem. doping/dedoping lithium and a nonaq. electrolyte interposed between the **cathode** and the anode. The nonaq. electrolyte includes at least one or more kinds of vinylene carbonate, methoxybenzene compds. or antioxidants. The nonaq. electrolyte secondary **battery** has a good cyclic characteristic under any environment of low temp., ambient temp. and high temp.

IT 12190-79-3, Cobalt lithium oxide colio2 37220-89-6
 , Aluminum lithium oxide 39302-37-9, Lithium
 titanium oxide 52627-24-4, Cobalt
 lithium oxide 113066-89-0, Cobalt lithium nickel oxide
 Co_{0.2}LiNi_{0.8}O₂
 (nonaq. electrolyte secondary **battery**)

RN 12190-79-3 HCA

CN Cobalt lithium oxide (CoLiO₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

RN 37220-89-6 HCA

CN Aluminum lithium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Li	x	7439-93-2
Al	x	7429-90-5

RN 39302-37-9 HCA

CN Lithium titanium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Ti	x	7440-32-6
Li	x	7439-93-2

RN 52627-24-4 HCA

CN Cobalt lithium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Co	x	7440-48-4
Li	x	7439-93-2

RN 113066-89-0 HCA

CN Cobalt lithium nickel oxide (Co_{0.2}LiNi_{0.8}O₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	0.2	7440-48-4
Ni	0.8	7440-02-0
Li	1	7439-93-2

IC ICM H01M010-40

ICS H01M004-48

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST nonaq electrolyte secondary **battery**

IT Phenols, uses

(antioxidant; nonaq. electrolyte secondary **battery**)

IT Amines, uses

(arom., antioxidant; nonaq. electrolyte secondary **battery**)IT Secondary **batteries**(lithium; nonaq. electrolyte secondary **battery**)

IT Antioxidants

Battery cathodes(nonaq. electrolyte secondary **battery**)IT **Carbonaceous** materials (technological products)(nonaq. electrolyte secondary **battery**)

IT 50-81-7, Vitamin c, uses 106-51-4, Quinone, uses 117-39-5,
 Quercetin 128-37-0, 2,6-Di-tert-butyl-p-cresol, uses 452-10-8,
 2,4-DiFluoroanisole 459-60-9, 4-Fluoroanisole 578-57-4,
 2-Bromoanisole 1406-18-4, Vitamin e 3150-40-1,
 2,3,5,6-Tetrafluoro-4-methylanisole

(antioxidant; nonaq. electrolyte secondary **battery**)

IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate
 616-38-6, Dimethyl carbonate 11113-67-0, Iron lithium oxide
 11126-15-1, Lithium vanadium oxide 12190-79-3, Cobalt
 lithium oxide colio2 21324-40-3, Lithium hexafluorophosphate
37220-89-6, Aluminum lithium oxide **39302-37-9**,
 Lithium **titanium oxide** 39457-42-6, Lithium

manganese oxide 51177-06-1, Chromium Lithium oxide
52627-24-4, Cobalt lithium oxide 52934-05-1, Gallium
Lithium oxide 56450-51-2, Lithium zinc oxide 66554-04-9, Lithium
magnesium oxide 104708-77-2, Copper lithium
oxide 113066-89-0, Cobalt lithium nickel oxide
Co_{0.2}LiNi_{0.8}O₂ 130917-43-0, Chromium lithium manganese
oxideCr_{0.2}LiMn_{1.8}O₄ 160479-36-7, Lithium tin oxide 377755-92-5,
Lithium borate oxide 377755-93-6, Calcium lithium oxide
377755-94-7, Lithium strontium oxide

(nonaq. electrolyte secondary **battery**)

IT 7439-93-2, Lithium, uses

(nonaq. electrolyte secondary **battery**)

IT 100-66-3, Methoxybenzene, uses 104-92-7, 4-Bromoanisole
872-36-6, Vinylene carbonate

(nonaq. electrolyte secondary **battery**)

L61 ANSWER 12 OF 15 HCA COPYRIGHT 2006 ACS on STN

135:244993 Nonaqueous electrolyte secondary **battery** and method
of preparing **carbon-based material** for anode.

Omaru, Atsuo; Fujishige, Yusuke (Sony Corporation, Japan). Eur.

Pat. Appl. EP 1134827 A2 **20010919**, 30 pp. DESIGNATED

STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE,
MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW.

APPLICATION: EP 2001-106598 20010315. PRIORITY: JP 2000-73453
20000316.

AB The title anode contains **graphite** in which G_s denoted by
the formula $G_s = H_{sg}/H_{sd}$ in the surface enhanced Raman spectrum is
≤10; where H_{sg} is the height of a signal having a peak within
the range of 1580/cm to 1400/cm, both inclusive. In a nonaq.
electrolyte secondary **battery** comprising a **cathode**
, an anode, and a nonaq. electrolyte, the anode contains
graphite having ≥2 peaks on a differential
thermogravimetric curve obtained by TGA in an airflow. The
graphite material can be obtained by mixing a **carbon**
-based **material** with a coating material such as pitch or
by applying a heat treatment to a **carbon-based**
material in an oxidizing atm. and then performing
graphitization.

IT 7782-42-5, **Graphite**, uses 12190-79-3,
cobalt lithium oxide colio₂ 37220-89-6, Aluminum lithium
oxide 39302-37-9, Lithium **titanium oxide**
52627-24-4, Cobalt lithium oxide

(nonaq. electrolyte secondary **battery** and method of
prepg. **carbon-based material** for anode)

RN 7782-42-5 HCA

CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

RN 12190-79-3 HCA
 CN Cobalt lithium oxide (CoLiO₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

RN 37220-89-6 HCA
 CN Aluminum lithium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Li	x	7439-93-2
Al	x	7429-90-5

RN 39302-37-9 HCA
 CN Lithium titanium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Ti	x	7440-32-6
Li	x	7439-93-2

RN 52627-24-4 HCA
 CN Cobalt lithium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Co	x	7440-48-4
Li	x	7439-93-2

IC ICM H01M004-58
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST **battery anode carbon based material**
 IT Petroleum pitch

- (coke; nonaq. electrolyte secondary **battery** and method of prepg. **carbon-based material** for anode)
- IT **Battery** anodes
Coal tar pitch
Graphitization
Heat treatment
Pitch
Secondary **batteries**
(nonaq. electrolyte secondary **battery** and method of prepg. **carbon-based material** for anode)
- IT **Carbonaceous** materials (technological products)
(nonaq. electrolyte secondary **battery** and method of prepg. **carbon-based material** for anode)
- IT **Carbon black**, uses
(nonaq. electrolyte secondary **battery** and method of prepg. **carbon-based material** for anode)
- IT Fluoropolymers, uses
(nonaq. electrolyte secondary **battery** and method of prepg. **carbon-based material** for anode)
- IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 208-96-8D, Acenaphthylene, pyrolyzed 616-38-6, Dimethyl carbonate 7782-42-5, **Graphite**, uses 9003-07-0, Polypropylene 11113-67-0, Iron lithium oxide 12190-79-3, cobalt lithium oxide colio2 21324-40-3, Lithium hexafluorophosphate 37220-89-6, Aluminum lithium oxide 39300-70-4, Lithium nickel oxide 39302-37-9, Lithium **titanium oxide** 39457-42-6, Lithium manganese oxide 51177-06-1, Chromium lithium oxide 52627-24-4, Cobalt lithium oxide
(nonaq. electrolyte secondary **battery** and method of prepg. **carbon-based material** for anode)
- IT 74-85-1, Ethylene, uses 75-05-8, Acetonitrile, uses 100-66-3, Anisole, uses 110-02-1, Thiophene 512-56-1, Trimethyl phosphate 1330-20-7, Xylene, uses 24937-79-9, PvdF 25167-67-3, Butene
(nonaq. electrolyte secondary **battery** and method of prepg. **carbon-based material** for anode)
- L61 ANSWER 13 OF 15 HCA COPYRIGHT 2006 ACS on STN
134:254689 Nonaqueous electrolyte secondary **battery**.
Yamaguchi, Akira; Hatake, Shinji; Omaru, Atsuo; Nagamine, Masayuki (Sony Corporation, Japan). Eur. Pat. Appl. EP 1089366 A1 20010404, 20 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW. APPLICATION: EP 2000-121433 20000929. PRIORITY: JP 1999-278249 19990930.
- AB A nonaq. electrolyte secondary **battery** is disclosed with a **pos. electrode** including a **pos.-electrode** active material, a neg. electrode including a

neg.-electrode active material, and a nonaq. electrolyte soln. The neg. electrode further includes carbon fibers and carbon flakes. The synergistic effects of the improved retention of the electrolyte soln. by the carbon fibers and the improved cond. between the active material particles by the carbon flakes facilitate doping/undoping of lithium in a high-load current mode and increase the capacity of the **battery** in the high-load current mode.

IT 7440-44-0, Carbon, uses
(flakes; nonaq. electrolyte secondary **battery**)
RN 7440-44-0 HCA
CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

IT 7782-42-5, Graphite, uses 12190-79-3,
Cobalt lithium oxide colio2 37220-89-6, Aluminum lithium
oxide 39302-37-9, Lithium **titanium oxide**
52627-24-4, Cobalt lithium oxide
(nonaq. electrolyte secondary **battery**)
RN 7782-42-5 HCA
CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

RN 12190-79-3 HCA
CN Cobalt lithium oxide (CoLiO₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

RN 37220-89-6 HCA
CN Aluminum lithium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Li	x	7439-93-2
Al	x	7429-90-5

RN 39302-37-9 HCA
CN Lithium titanium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Ti	x	7440-32-6
Li	x	7439-93-2

RN 52627-24-4 HCA

CN Cobalt lithium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Co	x	7440-48-4
Li	x	7439-93-2

IC ICM H01M004-62

ICS H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST **battery** nonaq electrolyte secondary

IT Coal tar pitch

(binder; nonaq. electrolyte secondary **battery**)

IT EPDM rubber

Fluoropolymers, uses

Styrene-butadiene rubber, uses

(binder; nonaq. electrolyte secondary **battery**)IT Secondary **batteries**(lithium; nonaq. electrolyte secondary **battery**)IT **Battery** anodes**Battery** cathodes**Battery** electrolytes(nonaq. electrolyte secondary **battery**)

IT Carbon fibers, uses

Carbonaceous materials (technological products)(nonaq. electrolyte secondary **battery**)

IT Coke

(nonaq. electrolyte secondary **battery**)

IT 9002-84-0, Ptfе 24937-79-9, Pvdф

(binder; nonaq. electrolyte secondary **battery**)IT **7440-44-0**, Carbon, uses(flakes; nonaq. electrolyte secondary **battery**)

IT 60-29-7, Diethyl ether, uses 75-05-8, Acetonitrile, uses

96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate

105-58-8, Diethyl carbonate 107-12-0, Propionitrile 108-32-7,

Propylene carbonate 109-99-9, Thf, uses 110-71-4,

1,2-Dimethoxyethane 126-33-0, Sulfolane 616-38-6, Dimethyl

carbonate 623-53-0, Ethyl methyl carbonate 646-06-0,
1,3-Dioxolane 872-36-6, Vinylene carbonate 1072-47-5,
4-Methyl-1,3-dioxolane 2550-62-1, Lithium methanesulfonate
7447-41-8, Lithium chloride, uses 7550-35-8, Lithium bromide
7782-42-5, Graphite, uses 7791-03-9, Lithium
perchlorate 11113-67-0, Iron lithium oxide 11126-15-1, Lithium
vanadium oxide **12190-79-3**, Cobalt lithium oxide colio2
14283-07-9, Lithium tetrafluoroborate 14485-20-2, Lithium
tetraphenylborate 21324-40-3, Lithium hexafluorophosphate
29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium
triflate 35678-71-8, Methylsulfolane **37220-89-6**,
Aluminum lithium oxide 39300-70-4, Lithium nickel oxide
39302-37-9, Lithium titanium oxide
39457-42-6, Lithium manganese oxide **52627-24-4**, Cobalt
lithium oxide

(nonaq. electrolyte secondary **battery**)

IT 9003-55-8

(styrene-butadiene rubber, binder; nonaq. electrolyte secondary
battery)

L61 ANSWER 14 OF 15 HCA COPYRIGHT 2006 ACS on STN

134:210599 Long cycle-life alkali metal **battery** with
cathode coated with a very thin protective film. Peled,
Emanuel; Golodnitsky, Diana; Strauss, Ela (Ramat University
Authority for Applied Research and Industrial Development L,
Israel). U.S. US 6203947 B1 **20010320**, 16 pp. (English).
CODEN: USXXAM. APPLICATION: US 1999-280646 19990329. PRIORITY: IL
1998-124007 19980408.

AB The present invention provides a **cathode** for use in a
secondary electrochem. cell, such
cathode being coated with a very thin, protective film,
permeable to ions. The protective film of the **cathode**
usually has a thickness of up to about 0.1 μm and it provides
protection against high voltage charging and overdischarging. The
present invention further provides a **secondary**
electrochem. cell comprising such a
cathode.

IT 1309-48-4, **Magnesia**, uses 1344-28-1,
Alumina, uses 13463-67-7, **Titania**, uses
(filler; long cycle-life alkali metal **battery** with
cathode coated with very thin protective film)

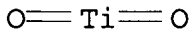
RN 1309-48-4 HCA

CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)

Mg=O

RN 1344-28-1 HCA

CN Aluminum oxide (Al₂O₃) (8CI, 9CI) (CA INDEX NAME)
 *** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
 RN 13463-67-7 HCA
 CN Titanium oxide (TiO₂) (8CI, 9CI) (CA INDEX NAME)



IT 12190-79-3, Cobalt lithium oxide colio2
 (long cycle-life alkali metal **battery** with
cathode coated with very thin protective film)
 RN 12190-79-3 HCA
 CN Cobalt lithium oxide (CoLiO₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IT 7440-44-0, Carbon, uses 7782-42-5,
Graphite, uses
 (stainless steel coated with; long cycle-life alkali metal
battery with **cathode** coated with very thin
 protective film)
 RN 7440-44-0 HCA
 CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

RN 7782-42-5 HCA
 CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

IC ICM H01M004-58
 INCL 429231950
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 38
 ST **battery cathode** protective film coated
 IT Alloys, uses
 (alkali metal; long cycle-life alkali metal **battery**
 with **cathode** coated with very thin protective film)
 IT Alkali metals, uses
 (alloys; long cycle-life alkali metal **battery** with

- cathode** coated with very thin protective film)
- IT Fluoropolymers, uses
Polycarbonates, uses
Polyoxyalkylenes, uses
(binder; long cycle-life alkali metal **battery** with
cathode coated with very thin protective film)
- IT Polyoxyalkylenes, uses
(lithium complex; long cycle-life alkali metal **battery**
with **cathode** coated with very thin protective film)
- IT **Battery cathodes**
Coating materials
Polymer electrolytes
(long cycle-life alkali metal **battery** with
cathode coated with very thin protective film)
- IT Alkali metals, uses
(long cycle-life alkali metal **battery** with
cathode coated with very thin protective film)
- IT 9003-17-2, Polybutadiene 9003-53-6, Polystyrene 24937-79-9, PvdF
25014-41-9, Polyacrylonitrile 25322-68-3, Peo
(binder; long cycle-life alkali metal **battery** with
cathode coated with very thin protective film)
- IT 7429-90-5, Aluminum, uses 7440-02-0, Nickel, uses 12597-68-1,
Stainless steel, uses
(current collector; long cycle-life alkali metal **battery**
with **cathode** coated with very thin protective film)
- IT 7439-89-6, Iron, uses 7439-95-4, Magnesium, uses 7439-96-5,
Manganese, uses 7440-42-8, Boron, uses 7440-48-4, Cobalt, uses
7440-70-2, Calcium, uses
(dopant; long cycle-life alkali metal **battery** with
cathode coated with very thin protective film)
- IT 1309-48-4, **Magnesia**, uses 1314-23-4, Zirconia,
uses 1344-28-1, **Alumina**, uses 7631-86-9,
Silica, uses 13463-67-7, **Titania**, uses
(filler; long cycle-life alkali metal **battery** with
cathode coated with very thin protective film)
- IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate
108-32-7, Propylene carbonate 616-38-6, Dimethyl carbonate
623-53-0, Ethyl methyl carbonate 1309-36-0, Pyrite, uses
1314-62-1, Vanadium pentoxide, uses 7439-93-2, Lithium, uses
7550-35-8, Lithium bromide 7570-02-7, DiVinyl carbonate
10377-51-2, Lithium iodide 10411-26-4, Butyl carbonate
12031-65-1, Lithium nickel oxide LiNiO_2 12039-13-3, Titanium
disulfide 12057-17-9, Lithium manganese oxide LiMn_2O_4
12068-85-8, Iron sulfide FeS_2 12190-79-3, Cobalt lithium
oxide CoLiO_2 14283-07-9, Lithium tetrafluoroborate 21324-40-3,
Lithium hexafluorophosphate 24991-55-7, Polyethylene glycol
dimethyl ether 25322-68-3D, Peo, lithium complex 26098-78-2,
Ethylene oxide-methylmethacrylate copolymer 90076-65-6

- 329038-54-2, Vanadium oxide (V8013)
(long cycle-life alkali metal **battery** with
cathode coated with very thin protective film)
- IT 7439-93-2D, Lithium, polyethylene oxide complex, uses
(long cycle-life alkali metal **battery** with
cathode coated with very thin protective film)
- IT 33454-82-9, Lithium triflate
(stainless steel coated with; long cycle-life alkali metal
battery with **cathode** coated with very thin
protective film)
- IT 7440-44-0, Carbon, uses 7782-42-5,
Graphite, uses
(stainless steel coated with; long cycle-life alkali metal
battery with **cathode** coated with very thin
protective film)

L61 ANSWER 15 OF 15 HCA COPYRIGHT 2006 ACS on STN

129:59833 Identification of **cathode** materials for lithium
batteries guided by first-principles calculations. Ceder,
G.; Chiang, Y.-M.; Sadoway, D. R.; Aydinol, M. K.; Jang, Y.-I.;
Huang, B. (Department of Materials Science and Engineering,
Massachusetts Inst. of Technology, Cambridge, MA, 02139-4307, USA).
Nature (London), 392(6677), 694-696 (English) 1998.

CODEN: NATUAS. ISSN: 0028-0836. Publisher: Macmillan Magazines.

- AB Lithium **batteries** have the highest energy d. of all
rechargeable **batteries** and are favored in applications
where low wt. or small vol. are desired- for example, laptop
computers, cellular telephones and elec. vehicles. One of the
limitations of present com. lithium **batteries** is the high
cost of the **LiCoO2 cathode** material. Searches
for a replacement material that, like **LiCoO2**, intercalates
lithium ions reversibly have covered most of the known
lithium/transition-metal oxides, but the no. of possible mixts. of
these is almost limitless, making an empirical search laborious and
expensive. Here we show that first principles calcns. can instead
direct the search for possible **cathode** materials. Through
such calcns. we identify a large class of new candidate materials in
which non-transition metals are substituted for transition metals.
The replacement with non-transition metals is driven by the
realization that oxygen, rather than transition-metal ions, function
as the electron acceptor upon insertion of Li. For one such
material, **Li(Co,Al)O2**, we predict and verify exptl. that aluminum
substitution raises the cell voltage while decreasing both the d. of
the material and its cost.

- IT 12190-79-3, Lithium cobalt oxide **LiCoO2**
12190-79-3D, Lithium cobalt oxide **LiCoO2**,
lithium-deficient
(**cathode** materials for lithium **batteries**)

guided by first-principles calcns.)

RN 12190-79-3 HCA

CN Cobalt lithium oxide (CoLiO₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

RN 12190-79-3 HCA

CN Cobalt lithium oxide (CoLiO₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IT 12003-67-7, Aluminum lithium oxide **LiAlO₂**

37220-89-6, Aluminum lithium oxide

(identification of **cathode** materials for lithium
batteries guided by first-principles calcns.)

RN 12003-67-7 HCA

CN Aluminate (AlO₂⁻), lithium (9CI) (CA INDEX NAME)



RN 37220-89-6 HCA

CN Aluminum lithium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Li	x	7439-93-2
Al	x	7429-90-5

CC 72-2 (Electrochemistry)

Section cross-reference(s): 52, 69, 75, 78

- ST **cathode** material lithium secondary **battery**
calcn; transition metal oxide lithium intercalation **cathode**
- IT Mathematical methods
(calcn.; identification of **cathode** materials for
lithium **batteries** guided by first-principles calcns.)
- IT Intercalation
(electrochem.; of **cathode** materials for lithium
batteries guided by first-principles calcns.)
- IT Formation enthalpy
(for Li(M,Al)O_2 mixts. with $\text{M}=\text{Ti, V, Fe, Co}$: identification of
cathode materials for lithium **batteries** guided
by first-principles calcns.)
- IT Transmission electron microscopy
X-ray diffraction
(identification of **cathode** materials for lithium
batteries)
- IT **Battery cathodes**
Electron density
(identification of **cathode** materials for lithium
batteries guided by first-principles calcns.)
- IT Open circuit potential
(in LiCoO_2 and in Al-doped **cathode** materials)
- IT **Carbon black**, uses
(in **cathode** formation in study of **cathode**
materials for lithium **batteries**)
- IT Transition metal oxides
(in **cathode** materials for lithium **batteries**
guided by first-principles calcns.)
- IT 12190-79-3, Lithium cobalt oxide LiCoO_2
12190-79-3D, Lithium cobalt oxide LiCoO_2 ,
lithium-deficient
(**cathode** materials for lithium **batteries**
guided by first-principles calcns.)
- IT 7439-93-2, Lithium, uses
(identification of **cathode** materials for lithium
batteries guided by first-principles calcns.)
- IT 12003-67-7, Aluminum lithium oxide LiAlO_2
37220-89-6, Aluminum lithium oxide 191665-64-2, Aluminum
cobalt lithium oxide $\text{Al}_{0.25}\text{Co}_{0.75}\text{LiO}_2$ 191665-64-2D, Aluminum
cobalt lithium oxide $\text{Al}_{0.25}\text{Co}_{0.75}\text{LiO}_2$, lithium-deficient
199923-78-9D, Aluminum cobalt lithium oxide $\text{Al}_{0.5}\text{Co}_{0.5}\text{LiO}_2$,
lithium-deficient 199923-81-4, Aluminum cobalt lithium oxide
 AlCoLiO_2 206552-76-3, Aluminum cobalt lithium oxide
 $\text{Al}_{0.67}\text{Co}_{0.33}\text{LiO}_2$ 206552-77-4, Aluminum cobalt lithium oxide
 $\text{Al}_{0.33}\text{Co}_{0.67}\text{LiO}_2$ 208708-60-5, Aluminum cobalt lithium oxide
($\text{Al}_{0.5}\text{Co}_{0.5}\text{Li}_{0.4}\text{O}_2$)
(identification of **cathode** materials for lithium
batteries guided by first-principles calcns.)

- IT 1310-65-2, Lithium hydroxide 10141-05-6, Cobalt nitrate
13473-90-0, Aluminum nitrate
(in formation of **cathode** materials for lithium
batteries)
- IT 189633-22-5, Aluminum cobalt hydroxide
(prepg. in formation of **cathode** materials for lithium
batteries)
- IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate
21324-40-3, Lithium hexafluorophosphate
(study of **cathode** materials for lithium
batteries in electrolyte contg.)

=> D HIS L65-

FILE 'HCA' ENTERED AT 16:45:35 ON 24 NOV 2006

L65 268531 S L7
L66 99686 S L8
L67 219060 S L24 OR TIO2
L68 354 S (L5 OR L6) AND (L65 OR L66 OR L13 OR L19 OR L20 OR L23
L69 249 S L68 AND L31 AND L32
L70 36 S L64 AND L69

=> D L70 1-36 CBIB ABS HITSTR HITIND

L70 ANSWER 1 OF 36 HCA COPYRIGHT 2006 ACS on STN

143:81123 Lithium-transition metal mixed oxides and phosphates as
candidate **cathodes** for rechargeable lithium
batteries. Jordy, Christian; Boeue, Jean Pierre; Biensan,
Philippe (Alcatel, Fr.). Fr. Demande FR 2864349 A1 20050624, 16 pp.
(French). CODEN: FRXXBL. APPLICATION: FR 2003-15225 20031223.

AB **Cathodes** for rechargeable lithium **batteries**
consist of a mixt. of: (1) a mixed transition metal-lithium oxide of
formula $\text{Li}_x\text{M}_1\text{yO}_2\text{y}$ ($x = 0-1$, $y = 1$ or 2), with (2) a mixed transition
metal-lithium phosphate of formula $\text{Li}_t\text{M}_2\text{zPO}_4$ ($x = 0-3$; $z = 1$ or 2),
in which M_1 is selected from Ni, Co, and Mn, and M_2 is selected from
Fe, Ni, Co, Mn, and V. Preferred candidate oxides and phosphates
include LiNiO_2 , LiCoO_2 , LiMnO_2 , LiMn_2O_4 , LiFePO_4
, LiVPO_4F , and $\text{Li}_3\text{Fe}_2\text{PO}_4$. **Battery** anodes are selected
from Li, Li alloys, and a **carbon-based material**
(e.g., **graphite**, **coke**, **carbon black**,
and glassy **carbon**) capable of intercalating lithium or a
lithium-transition metal oxide.

IT 12190-79-3P, Cobalt lithium oxide (CoLiO_2)
(**cathodes**; lithium-transition metal mixed oxides and

phosphates as candidate **cathodes** for rechargeable lithium **batteries**)

RN 12190-79-3 HCA

CN Cobalt lithium oxide (CoLiO₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IC ICM H01M004-52

ICS H01M004-24

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST **battery cathode** lithium transition metal oxide phosphate

IT **Battery** anodes

Battery cathodes

(lithium-transition metal mixed oxides and phosphates as candidate **cathodes** for rechargeable lithium **batteries**)

IT Transition metal oxides

(mixed lithium oxides, **cathodes**; lithium-transition metal mixed oxides and phosphates as candidate **cathodes** for rechargeable lithium **batteries**)

IT 7664-38-2DP, Phosphoric acid, mixed lithium-transition metal salts
12031-65-1P, Lithium nickel oxide (LiNiO₂) 12057-17-9P, Lithium
manganese oxide (LiMn₂O₄) 12162-79-7P, Lithium manganese oxide
(LiMnO₂) **12190-79-3P**, Cobalt lithium oxide (CoLiO₂)
15365-14-7P, Iron lithium phosphate (FeLiPO₄) 36058-25-0P
193214-24-3P, Aluminum cobalt lithium nickel oxide
(Al_{0.05}Co_{0.15}LiNi_{0.80}O₂) 372075-83-7P, Lithium vanadium fluoride
phosphate (LiVF(PO₄))

(**cathodes**; lithium-transition metal mixed oxides and phosphates as candidate **cathodes** for rechargeable lithium **batteries**)

L70 ANSWER 2 OF 36 HCA COPYRIGHT 2006 ACS on STN

143:46083 **Cathode** material for nonaqueous electrolyte lithium

ion **battery**. Itou, Takanori; Saito, Takamitsu; Horie,

Hideaki (Nissan Motor Co., Ltd., Japan). PCT Int. Appl. WO

2005055344 A2 20050616, 47 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US,

UZ, VC, VN, YU, ZA, ZM, ZW; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IS, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2.

APPLICATION: WO 2004-JP18085 20041129. PRIORITY: JP 2003-407542 20031205; JP 2004-334800 20041118.

AB A **pos. electrode** material for non-aq. electrolyte lithium ion **battery** of the present invention has an oxide contg. lithium and nickel, and a lithium compd. which is deposited on a surface of the oxide and covers nickel present on the surface of the oxide. By this structure, it is possible to suppress decompn. of an electrolysis soln. as much as possible and drastically reduce swelling of the **batteries**.

IT 128975-24-6, Lithium manganese nickel oxide $\text{LiMn}_{0.5}\text{Ni}_{0.5}\text{O}_2$ (**cathode** material for nonaq. electrolyte lithium ion **battery**)

RN 128975-24-6 HCA

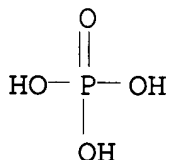
CN Lithium manganese nickel oxide ($\text{Li}_2\text{MnNiO}_4$) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	4	17778-80-2
Ni	1	7440-02-0
Mn	1	7439-96-5
Li	2	7439-93-2

IT 10377-52-3, Lithium phosphate 52627-24-4, Cobalt lithium oxide (coating; **cathode** material for nonaq. electrolyte lithium ion **battery**)

RN 10377-52-3 HCA

CN Phosphoric acid, trilithium salt (8CI, 9CI) (CA INDEX NAME)



● 3 Li

RN 52627-24-4 HCA

CN Cobalt lithium oxide (9CI) (CA INDEX NAME)

Component		Ratio		Component
-----------	--	-------	--	-----------

		Registry Number
O	x	17778-80-2
Co	x	7440-48-4
Li	x	7439-93-2

IC ICM H01M004-00
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST **cathode** material nonaq electrolyte lithium ion
battery
 IT **Battery cathodes**
 Vehicles
 (cathode material for nonaq. electrolyte lithium ion
battery)
 IT **Carbon black**, uses
 Fluoropolymers, uses
 (cathode material for nonaq. electrolyte lithium ion
battery)
 IT Secondary **batteries**
 (lithium; **cathode** material for nonaq. electrolyte
 lithium ion **battery**)
 IT 39300-70-4, Lithium nickel oxide **128975-24-6**, Lithium
 manganese nickel oxide $\text{LiMn}_{0.5}\text{Ni}_{0.5}\text{O}_2$ 218446-67-4, Aluminum cobalt
 lithium nickel oxide ($\text{Al}_{0.02}\text{Co}_{0.15}\text{LiNi}_{0.83}\text{O}_2$)
 (cathode material for nonaq. electrolyte lithium ion
battery)
 IT 24937-79-9, PvdF
 (cathode material for nonaq. electrolyte lithium ion
battery)
 IT 852709-57-0, Lithium metaphosphate nitride oxide
 ($\text{Li}_{2.9}(\text{PO}_3)\text{N}_{0.36}\text{O}_{0.3}$)
 (cathode material for nonaq. electrolyte lithium ion
battery)
 IT 546-89-4, Lithium acetate 553-54-8, Lithium benzoate 553-91-3,
 Lithium oxalate 554-13-2, Lithium carbonate 868-17-7, Lithium
 tartrate 1303-86-2, Boron oxide (B_2O_3), uses 1310-65-2, Lithium
 hydroxide 2922-61-4, Lithium pyruvate 4485-12-5, Lithium
 stearate 6867-30-7, Lithium acetylde ethylenediamine complex
 7439-93-2D, Lithium, compd. 7550-35-8, Lithium bromide
 7789-24-4, Lithium fluoride, uses 7790-69-4, Lithium nitrate
 10377-48-7, Lithium sulfate 10377-51-2, Lithium iodide
10377-52-3, Lithium phosphate 12057-24-8, Lithium oxide
 (Li_2O), uses 13759-10-9, Silicon sulfide (SiS_2) 15365-14-7, Iron
 lithium phosphate felipo_4 39457-42-6, Lithium manganese oxide
52627-24-4, Cobalt lithium oxide 184905-46-2, Lithium
 nitrogen phosphorus oxide
 (coating; **cathode** material for nonaq. electrolyte
 lithium ion **battery**)

L70 ANSWER 3 OF 36 HCA COPYRIGHT 2006 ACS on STN

142:358045 Rechargeable lithium **battery**. Hwang, Duck-Chul;
Hwang, Seung-Sik; Lee, Sang-Mock; Cho, Chung-Kun; Choi, Yun-Suk
(Samsung SDI Co., Ltd., S. Korea). U.S. Pat. Appl. Publ. US
2005069775 A1 20050331, 21 pp. (English). CODEN: USXXCO.
APPLICATION: US 2004-933384 20040903. PRIORITY: KR 2003-66900
20030926.

AB A rechargeable lithium **battery** includes a **pos.**
electrode having a **pos.** active material to
reversibly intercalate and deintercalate lithium ions, a neg.
electrode having a neg. active material, and an electrolyte, wherein
an arithmetic mean Ra of a surface roughness of the **pos.**
electrode is 155 to 419 nm, and an arithmetic mean Ra of a
surface roughness of the neg. electrode is 183 to 1159 nm after the
rechargeable lithium **battery** is charged and discharged.

IT 7440-44-0, Super-p, uses
(activated; rechargeable lithium **battery**)

RN 7440-44-0 HCA

CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

IT 12190-79-3, Cobalt lithium oxide (CoLiO₂) 13568-36-0
, Lithium nickel vanadium oxide (LiNiVO₄) 329025-35-6,
Iron lithium phosphate (Fe₂Li₁₋₃(PO₄)₃)
(rechargeable lithium **battery**)

RN 12190-79-3 HCA

CN Cobalt lithium oxide (CoLiO₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

RN 13568-36-0 HCA

CN Lithium nickel vanadium oxide (LiNiVO₄) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	4	17778-80-2
V	1	7440-62-2
Ni	1	7440-02-0
Li	1	7439-93-2

RN 329025-35-6 HCA
 CN Iron lithium phosphate ($\text{Fe}_2\text{Li}_{1-3}(\text{PO}_4)_3$) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O4P	3	14265-44-2
Li	1 - 3	7439-93-2
Fe	2	7439-89-6

IC ICM H01M004-58
 ICS H01M004-48; H01M004-50; H01M004-52
 INCL 429231950; 429223000; 429231100; 429231200; 429224000; 429218100;
 429231300; 429231000; 429220000; 429221000
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST lithium secondary **battery**
 IT Secondary **batteries**
 (lithium; rechargeable lithium **battery**)
 IT **Battery cathodes**
 Surface roughness
 (rechargeable lithium **battery**)
 IT **Carbonaceous** materials (technological products)
 (rechargeable lithium **battery**)
 IT Fluoropolymers, uses
 (rechargeable lithium **battery**)
 IT **7440-44-0**, Super-p, uses
 (activated; rechargeable lithium **battery**)
 IT 96-49-1, Ethylene carbonate 616-38-6, Dimethyl carbonate
 623-53-0, Ethyl methyl carbonate 1314-62-1, Vanadium oxide (V_2O_5),
 uses 12031-65-1, Lithium nickel oxide (LiNiO_2) 12057-17-9,
 Lithium manganese oxide (LiMn_2O_4) 12162-79-7, Lithium manganese
 oxide limno_2 12162-92-4, Lithium vanadium oxide (LiV_2O_5)
12190-79-3, Cobalt lithium oxide (CoLiO_2) **13568-36-0**
 , Lithium nickel vanadium oxide (LiNiVO_4) 21324-40-3, Lithium
 hexafluorophosphate 179802-95-0, Cobalt lithium manganese nickel
 oxide ($\text{Co}_{0.1}\text{LiMn}_{0.1}\text{Ni}_{0.8}\text{O}_2$) **329025-35-6**, Iron lithium
 phosphate ($\text{Fe}_2\text{Li}_{1-3}(\text{PO}_4)_3$)
 (rechargeable lithium **battery**)
 IT 24937-79-9, PvdF
 (rechargeable lithium **battery**)

L70 ANSWER 4 OF 36 HCA COPYRIGHT 2006 ACS on STN
 142:138365 Lithium polymer **battery** systems. Naarmann,
 Herbert; Kruger, Franz Josef (Dilo Trading Ag, Switz.). Ger. Offen.
 DE 10328572 A1 20050127, 11 pp. (German). CODEN: GWXXBX.
 APPLICATION: DE 2003-10328572 20030625.
 AB The invention concerns a lithium polymer **battery** system

with active electrode masses single-phase pastes, which are applied on the anode current collector and the primed **cathode** current collector. A porous separator is **laminated** between the anode and the **cathode** current collectors. The electrode active mass is polymer binder-free.

IT 7440-44-0, Carbon, uses 7782-42-5,
Graphite, uses 52627-24-4, Cobalt lithium oxide
 (lithium polymer **battery** systems)
 RN 7440-44-0 HCA
 CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

RN 7782-42-5 HCA
 CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

RN 52627-24-4 HCA
 CN Cobalt lithium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Co	x	7440-48-4
Li	x	7439-93-2

IT 1309-48-4, **Magnesium oxide (MgO)**
), uses 1344-28-1, **Alumina**, uses
 (lithium polymer **battery** systems)
 RN 1309-48-4 HCA
 CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)

Mg=O

RN 1344-28-1 HCA
 CN Aluminum oxide (Al₂O₃) (8CI, 9CI) (CA INDEX NAME)
 *** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
 IC ICM H01M010-40
 ICS H01M004-00
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 38
 ST lithium polymer **battery** system
 IT Carbon fibers, uses

- (activated; lithium polymer **battery** systems)
- IT Molecular sieves
Nanotubes
(carbon; lithium polymer **battery** systems)
- IT **Battery** anodes
Battery cathodes
Cement
Soot
(lithium polymer **battery** systems)
- IT Ethers, uses
(lithium polymer **battery** systems)
- IT Mica-group minerals, uses
(lithium polymer **battery** systems)
- IT Zeolites (synthetic), uses
(lithium polymer **battery** systems)
- IT Secondary **batteries**
(lithium; lithium polymer **battery** systems)
- IT Perfluoro compounds
(perfluoroalkyl ethers; lithium polymer **battery** systems)
- IT Ethers, uses
(perfluoroalkyl; lithium polymer **battery** systems)
- IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate
108-32-7, Propylene carbonate 110-71-4 463-79-6D, Carbonic acid,
alkyl ester 616-38-6, Dimethyl carbonate 7440-44-0,
Carbon, uses 7782-42-5, **Graphite**, uses
11113-67-0, Iron lithium oxide 21324-40-3, Lithium
hexafluorophosphate 33454-82-9, Lithium triflate 37296-91-6,
Lithium molybdenum oxide 37349-20-5, Lithium tungsten oxide
39300-70-4, Lithium nickel oxide 39457-42-6, Lithium manganese
oxide 50926-11-9, Ito 51177-06-1, Chromium lithium oxide
52627-24-4, Cobalt lithium oxide 90076-65-6 244761-29-3,
Lithium bis(oxalato)borate
(lithium polymer **battery** systems)
- IT 1309-48-4, **Magnesium oxide (MgO**
) , uses 1344-28-1, **Alumina**, uses 12627-14-4,
Lithium silicate 12676-27-6
(lithium polymer **battery** systems)
- IT 7429-90-5, Aluminum, uses 7440-31-5, Tin, uses 7440-32-6,
Titanium, uses 7440-50-8, Copper, uses
(primed; lithium polymer **battery** systems)

L70 ANSWER 5 OF 36 HCA COPYRIGHT 2006 ACS on STN

142:25894 Nonaqueous electrolyte solution for secondary lithium
battery, its manufacture, and the **battery**.

Hinohara, Akio; Hayashi, Takeshi (Mitsui Chemicals Inc., Japan).
Jpn. Kokai Tokkyo Koho JP 2004342607 A2 20041202, 21 pp.

(Japanese). CODEN: JKXXAF. APPLICATION: JP 2004-125840 20040421.

PRIORITY: JP 2003-122309 20030425.

AB The electrolyte soln. contains a Li salt and a nonaq. solvent mixt. and is added with 0.1-10 wt.% silyl ester compd. and ≥ 0.01 wt.% tetrafluoroborate salt. The electrolyte soln. is manufd. by adding a silyl ester compd. and a tetrafluoroborate salt to a nonaq. electrolyte soln., contg. a Li salt and a nonaq. solvent mixt. The **battery** has a Li-intercalating anode, a **cathode**, and the above electrolyte soln.

IT 7782-42-5, **Graphite**, uses 12190-79-3, Cobalt lithium oxide (CoLiO₂) (compns. and manuf. of electrolyte solns. contg. silyl ester compds. and tetrafluoroborate salts for secondary lithium **batteries**)

RN 7782-42-5 HCA

CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

RN 12190-79-3 HCA

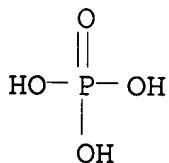
CN Cobalt lithium oxide (CoLiO₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IT 10377-52-3, **Lithium phosphate (Li₃PO₄)** (compns. and manuf. of electrolyte solns. contg. silyl ester compds. and tetrafluoroborate salts for secondary lithium **batteries**)

RN 10377-52-3 HCA

CN Phosphoric acid, trilithium salt (8CI, 9CI) (CA INDEX NAME)



●3 Li

IT 7440-44-0, **Carbon**, uses

(meso phase micro beads; compns. and manuf. of electrolyte solns. contg. silyl ester compds. and tetrafluoroborate salts for secondary lithium **batteries**)

RN 7440-44-0 HCA
CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

IC ICM. H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST secondary lithium **battery** nonaq electrolyte soln manuf;
battery electrolyte additive silyl ester compd
tetrafluoroborate salt
IT **Battery** electrolytes
(compns. and manuf. of electrolyte solns. contg. silyl ester
compds. and tetrafluoroborate salts for secondary lithium
batteries)
IT Secondary **batteries**
(lithium; compns. and manuf. of electrolyte solns. contg. silyl
ester compds. and tetrafluoroborate salts for secondary lithium
batteries)
IT 96-49-1, Ethylene carbonate 623-53-0, Ethyl methyl carbonate
7782-42-5, Graphite, uses 12190-79-3,
Cobalt lithium oxide (CoLiO₂) 21324-40-3, Lithium
hexafluorophosphate
(compns. and manuf. of electrolyte solns. contg. silyl ester
compds. and tetrafluoroborate salts for secondary lithium
batteries)
IT 429-06-1, Tetraethyl ammonium tetrafluoroborate 872-36-6, Vinylene
carbonate 7789-24-4, Lithium fluoride, uses 10377-48-7, Lithium
sulfate (Li₂SO₄) 10377-52-3, Lithium phosphate (
Li₃PO₄) 10497-05-9, Tris(trimethyl silyl) phosphate
13755-29-8, Sodium tetrafluoroborate 14283-07-9, Lithium
tetrafluoroborate 18306-29-1, Bis(trimethyl silyl) sulfate
(compns. and manuf. of electrolyte solns. contg. silyl ester
compds. and tetrafluoroborate salts for secondary lithium
batteries)
IT 7440-44-0, Carbon, uses
(meso phase micro beads; compns. and manuf. of electrolyte solns.
contg. silyl ester compds. and tetrafluoroborate salts for
secondary lithium **batteries**)

L70 ANSWER 6 OF 36 HCA COPYRIGHT 2006 ACS on STN

141:382180 Energy device with overcurrent protection and its
manufacture. Honda, Kazuyoshi; Okazaki, Sadayuki; Oishi, Kiichiro;
Takahashi, Makoto; Takai, Yoriko; Inaba, Junichi; Higuchi, Hiroshi;
Ito, Shuji (Matsushita Electric Industrial Co., Ltd., Japan). Jpn.

Kokai Tokkyo Koho JP 2004311073 A2 20041104, 29 pp. (Japanese).

CODEN: JKXXAF. APPLICATION: JP 2003-99591 20030402.

AB The device, preferably a secondary Li **battery**, has successively a substrate, an anode collector, a solid electrolyte, a **cathode** active mass layer, and a **cathode** collector; where the **cathode** and/or anode collector has a fuse, which melts by overcurrent. The device is prepd. by stacking an anode collector, a solid electrolyte, a **cathode** active mass, and a **cathode** collector on a substrate; where a fuse is formed in the anode or **cathode** collector.

IT 7440-44-0, Carbon, uses
(anode; structure and manuf. of secondary lithium
batteries contg. overcurrent protection fuse in electrode
collectors)

RN 7440-44-0 HCA

CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

IT 12190-79-3, Cobalt lithium oxide (CoLiO₂)
(**cathode**; structure and manuf. of secondary lithium
batteries contg. overcurrent protection fuse in electrode
collectors)

RN 12190-79-3 HCA

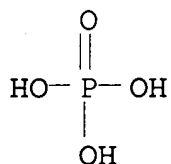
CN Cobalt lithium oxide (CoLiO₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IT 10377-52-3, Lithium phosphate
(electrolyte; structure and manuf. of secondary lithium
batteries contg. overcurrent protection fuse in electrode
collectors)

RN 10377-52-3 HCA

CN Phosphoric acid, trilithium salt (8CI, 9CI) (CA INDEX NAME)



●3 Li

- IC ICM H01M002-34
ICS H01M010-40
- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
- ST secondary lithium **battery** overcurrent protection fuse
structure manuf
- IT Secondary **batteries**
(lithium; structure and manuf. of secondary lithium
batteries contg. overcurrent protection fuse in electrode
collectors)
- IT Polyamides, uses
(substrates; structure and manuf. of secondary lithium
batteries contg. overcurrent protection fuse in electrode
collectors)
- IT 7440-21-3, Silicon, uses 7440-44-0, Carbon, uses
12798-95-7
(anode; structure and manuf. of secondary lithium
batteries contg. overcurrent protection fuse in electrode
collectors)
- IT 12190-79-3, Cobalt lithium oxide (CoLiO₂)
(**cathode**; structure and manuf. of secondary lithium
batteries contg. overcurrent protection fuse in electrode
collectors)
- IT 7440-02-0, Nickel, uses 7440-06-4, Platinum, uses
(electrode collectors; structure and manuf. of secondary lithium
batteries contg. overcurrent protection fuse in electrode
collectors)
- IT 10377-52-3, Lithium phosphate
(electrolyte; structure and manuf. of secondary lithium
batteries contg. overcurrent protection fuse in electrode
collectors)
- L70 ANSWER 7 OF 36 HCA COPYRIGHT 2006 ACS on STN
141:280353 Production of lithium compound phosphate **cathodes**
for secondary lithium ion **batteries**. Ishizuka, Masayuki;
Ono, Koji; Toge, Yoshiyuki; Saito, Mitsumasa (Sumitomo Osaka Cement
Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2004259471 A2

20040916, 13 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP
2003-45885 20030224.

AB The lithium compd. phosphates, having olivine-type structure, are produced by a process including steps of (1) spray thermal decompn. of solns. or suspensions contg. Li, metals excluding Li, and P, and (2) firing the resultant decompn. products. The phosphates may be expressed by Li_xAyPO_4 ($A = \text{Cr, Mn, Fe, Co, Ni, Cu}$; $0 < x < 2$; $0 < y \leq 1$). In the prodn., elec. conductive substances and/or their precursors may be added to the solns./suspensions. The **cathodes** can be economically produced, and secondary lithium **batteries** employing the **cathodes** show high discharge capacity.

IT **757954-88-4**, Lithium nickel phosphate ($\text{LiO}-2\text{NiO}-1(\text{PO}_4)$)
(**cathodes**; prepn. of lithium (transition) metal
phosphate **cathodes** for lithium ion **batteries**
by spray thermal decompn. and firing)

RN 757954-88-4 HCA

CN Lithium nickel phosphate ($\text{LiO}-2\text{NiO}-1(\text{PO}_4)$) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O4P	1	14265-44-2
Ni	0 - 1	7440-02-0
Li	0 - 2	7439-93-2

IT **757954-82-8P**, Iron lithium phosphate ($\text{FeO}-1\text{LiO}-2(\text{PO}_4)$)
(**cathodes**; prepn. of lithium (transition) metal
phosphate **cathodes** for lithium ion **batteries**
by spray thermal decompn. and firing)

RN 757954-82-8 HCA

CN Iron lithium phosphate ($\text{FeO}-1\text{LiO}-2(\text{PO}_4)$) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O4P	1	14265-44-2
Li	0 - 2	7439-93-2
Fe	0 - 1	7439-89-6

IC ICM H01M004-58

ICS C01B025-45; H01M004-62; H01M004-02; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST **battery cathode** lithium transition metal
phosphate

IT **Carbonaceous** materials (technological products)
(elec. conductive additives in **cathodes**; prepn. of
lithium (transition) metal phosphate **cathodes** for

- lithium ion **batteries** by spray thermal decompn. and firing)
- IT **Carbon black**, uses
(elec. conductive additives in **cathodes**; prepn. of lithium (transition) metal phosphate **cathodes** for lithium ion **batteries** by spray thermal decompn. and firing)
- IT **Secondary batteries**
(lithium; prepn. of lithium (transition) metal phosphate **cathodes** for lithium ion **batteries** by spray thermal decompn. and firing)
- IT **Battery cathodes**
(prepn. of lithium (transition) metal phosphate **cathodes** for lithium ion **batteries** by spray thermal decompn. and firing)
- IT **Thermal decomposition**
(spray; prepn. of lithium (transition) metal phosphate **cathodes** for lithium ion **batteries** by spray thermal decompn. and firing)
- IT 757954-84-0, Chromium lithium phosphate ($\text{CrO}-1\text{LiO}-2(\text{PO}_4)$)
757954-86-2, Lithium manganese phosphate ($\text{LiO}-2\text{MnO}-1(\text{PO}_4)$)
757954-88-4, Lithium nickel phosphate ($\text{LiO}-2\text{NiO}-1(\text{PO}_4)$)
757954-90-8, Copper lithium phosphate ($\text{CuO}-1\text{LiO}-2(\text{PO}_4)$)
(**cathodes**; prepn. of lithium (transition) metal phosphate **cathodes** for lithium ion **batteries** by spray thermal decompn. and firing)
- IT 757954-80-6P, Cobalt lithium phosphate ($\text{CoO}-1\text{LiO}-2(\text{PO}_4)$)
757954-82-8P, Iron lithium phosphate ($\text{FeO}-1\text{LiO}-2(\text{PO}_4)$)
(**cathodes**; prepn. of lithium (transition) metal phosphate **cathodes** for lithium ion **batteries** by spray thermal decompn. and firing)
- IT 1310-65-2, Lithium hydroxide 7447-41-8, Lithium chloride, processes 7664-38-2, Phosphoric acid, processes 7758-94-3, Iron chloride (FeCl_2) 7790-69-4, Lithium nitrate 10141-05-6
(in prepn. of lithium (transition) metal phosphate **cathodes** for lithium ion **batteries** by spray thermal decompn. and firing)
- IT 57-50-1, Sucrose, processes
(precursors for elec. conductive additives in **cathodes**; prepn. of lithium (transition) metal phosphate **cathodes** for lithium ion **batteries** by spray thermal decompn. and firing)
- L70 ANSWER 8 OF 36 HCA COPYRIGHT 2006 ACS on STN
140:409629 Method of fabrication of lithium polymer energy storage systems. Naarmann, Herbert; Kruger, Franz Josef (Gaia Akkumulatorenwerke G.m.b.H., Germany). Ger. Offen. DE 10251238 A1 20040519, 14 pp. (German). CODEN: GWXXBX. APPLICATION: DE

2002-10251238 20021104.

AB A new procedure for the prodn. of a lithium polymer energy storage system is disclosed. The energy storage systems so produced have an active **cathode** mass, a polymer electrolyte separator and an active anode mass. The active electrode masses are mixed with conducting salts and optionally conducting salt additives and/or solvents, ground intensively, the active electrode masses subsequently formed with polymer binders to batches, extruded and **laminated** on a current collector. The **laminated** electrode masses are **laminated** sep. optionally with **laminated** separator in sandwich layer and are joined together, so that the active electrode masses have porous structure. The present invention creates a targeted and orderly arrangement and allocation of the active electrode components with optimized effectiveness, as compared to the conventional procedures where the resp. components of the electrode masses are present randomly distributed only according to the coincidence principle.

IT 7782-42-5, Graphite, uses 39302-37-9,
Lithium titanium oxide 52627-24-4,
Cobalt Lithium oxide
(method of fabrication of lithium polymer energy storage systems)
RN 7782-42-5 HCA
CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

RN 39302-37-9 HCA
CN Lithium titanium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Ti	x	7440-32-6
Li	x	7439-93-2

RN 52627-24-4 HCA
CN Cobalt lithium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Co	x	7440-48-4
Li	x	7439-93-2

IT 1309-48-4, Magnesium oxide (MgO)

), uses **1344-28-1, Alumina**, uses
(method of fabrication of lithium polymer energy storage systems)

RN 1309-48-4 HCA

CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)

Mg=O

RN 1344-28-1 HCA

CN Aluminum oxide (Al₂O₃) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

IC ICM H01M004-04

ICS H01M004-48; H01M010-04; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 76

ST lithium polymer energy storage system fabrication; **battery**
lithium polymer

IT Secondary **batteries**

(lithium; method of fabrication of lithium polymer energy storage systems)

IT 7429-90-5, Aluminum, uses 7439-93-2D, Lithium, org. borate

7440-50-8, Copper, uses **7782-42-5, Graphite**,

uses 7791-03-9, Lithium perchlorate 9033-83-4, Polyphenylene

11126-15-1, Lithium vanadium oxide 12627-14-4, Lithium silicate

13453-69-5, Lithium metaborate 14283-07-9, Lithium

tetrafluoroborate 18115-70-3, Lithium acetylacetonate, uses

21324-40-3, Lithium hexafluorophosphate 25067-58-7, Polyacetylene

33454-82-9, Lithium triflate 37296-91-6, Lithium molybdenum oxide

37349-20-5, Lithium tungsten oxide 39300-70-4, Lithium nickel

oxide **39302-37-9, Lithium titanium oxide**

39457-42-6, Lithium manganese oxide 51177-06-1, Chromium lithium

oxide 51222-70-9, Lithium zirconium oxide **52627-24-4**,

Cobalt Lithium oxide 90076-65-6, Lithium

bis(trifluoromethylsulfonyl) imide

(method of fabrication of lithium polymer energy storage systems)

IT 57-13-6, Urea, uses 79-41-4D, Methacrylic acid, fluoroalkyl ester

463-79-6D, Carbonic acid, alkyl ester 1304-28-5, Barium oxide

(BaO), uses **1309-48-4, Magnesium oxide**

(MgO), uses **1344-28-1, Alumina**, uses

7631-86-9, Silica, uses 9002-88-4, Polyethylene 9003-19-4,

Polyvinyl ether 9003-29-6, Polybutene 9003-53-6, Polystyrene

24968-97-6, Polypyrrolidone 25038-32-8, Isoprene-styrene copolymer

25190-89-0, Hexafluoropropylene-tetrafluoroethylene-vinylidene

fluoride copolymer 26602-62-0, Butadiene-Isoprene-styrene

copolymer

(method of fabrication of lithium polymer energy storage systems)

140:393386 Procedure for fabrication of lithium-polymer energy storage systems. Naarmann, Herbert; Kruger, Franz Josef (Gaia Akkumulatorenwerke G.m.b.H., Germany). Ger. Offen. DE 10251194 A1 20040519, 13 pp. (German). CODEN: GWXXBX. APPLICATION: DE 2002-10251194 20021104.

AB A lithium-polymer energy storage system comprises an active **cathode** mass, a polymer electrolyte-separator, and an active anode mass. The active electrode masses are mixed and ground with conducting salts (if necessary with conducting salt additives) and solvents in a first process stage; in a second process stage it is intimately mixed with a polymer binder; and then in a third process stage are extruded and **laminated** sep. on a current collector; and the **laminated** electrode masses are joined together optionally with **laminated** separator in sandwich layer, so that the active electrode masses have defined structures. Esp., the procedure creates a targeted and orderly arrangement and allocation of the active electrode components with optimized effectiveness by the three successively arranged process stages.

IT 7440-44-0, Carbon, uses
(powder; procedure for fabrication of lithium-polymer energy storage systems)

RN 7440-44-0 HCA

CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

IT 7782-42-5, Graphite, uses 39302-37-9,
Lithium titanium oxide 52627-24-4,
Cobalt lithium oxide
(procedure for fabrication of lithium-polymer energy storage systems)

RN 7782-42-5 HCA

CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

RN 39302-37-9 HCA

CN Lithium titanium oxide (9CI) (CA INDEX NAME)

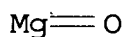
Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Ti	x	7440-32-6
Li	x	7439-93-2

RN 52627-24-4 HCA
 CN Cobalt lithium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Co	x	7440-48-4
Li	x	7439-93-2

IT 1309-48-4, **Magnesium oxide (MgO)**
), uses 1344-28-1, **Alumina**, uses
 (procedure for fabrication of lithium-polymer energy storage
 systems)

RN 1309-48-4 HCA
 CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)



RN 1344-28-1 HCA
 CN Aluminum oxide (Al₂O₃) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

IC ICM H01M004-04
 ICS H01M004-48; H01M004-62; H01M002-14

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 38

IT **Secondary batteries**
 (lithium; procedure for fabrication of lithium-polymer energy
 storage systems)

IT **Battery anodes**
Battery cathodes
 Energy storage
 (procedure for fabrication of lithium-polymer energy storage
 systems)

IT 7440-44-0, Carbon, uses
 (powder; procedure for fabrication of lithium-polymer energy
 storage systems).

IT 7439-93-2D, Lithium, organoborate 7782-42-5,
Graphite, uses 7791-03-9, Lithium perchlorate 9033-83-4,
 Polyphenylene 11126-15-1, Lithium vanadium oxide 14283-07-9,
 Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate
 25067-58-7, Polyacetylene. 33454-82-9, Lithium triflate
 37296-91-6, Lithium molybdenum oxide 37349-20-5, Lithium tungsten
 oxide 39300-70-4, Lithium nickel oxide 39302-37-9,
 Lithium **titanium oxide** 39457-42-6, Lithium
 manganese oxide 51177-06-1, Chromium lithium oxide 51222-70-9,
 Lithium zirconium oxide 52627-24-4, Cobalt lithium oxide

90076-65-6, Lithium bis(trifluoromethylsulfonyl)imide
(procedure for fabrication of lithium-polymer energy storage
systems)

IT 79-41-4D, Methacrylic acid, fluoroalkyl ester 463-79-6D, Carbonic
acid, alkyl ester 1304-28-5, Barium oxide (BaO), uses
1309-48-4, Magnesium oxide (MgO)
, uses **1344-28-1, Alumina**, uses 7631-86-9,
Silica, uses 9002-88-4, Polyethylene 9003-19-4, Polyvinyl ether
9003-29-6, Polybutene 9003-53-6, Polystyrene 12627-14-4, Lithium
silicate 13453-69-5, Lithium metaborate 18115-70-3, Lithium
acetylacetonate, uses 24968-97-6, Polypyrrolidone 25190-89-0,
Hexafluoropropene-tetrafluoroethene-vinylidene fluoride copolymer
(procedure for fabrication of lithium-polymer energy storage
systems)

L70 ANSWER 10 OF 36 HCA COPYRIGHT 2006 ACS on STN

140:342190 Integrated thermoelectric cell-thin film **battery**.
Shibano, Yasuyuki; Ito, Shuji; Iwamoto, Kazuya; Mino, Shinji;
Higuchi, Hiroshi; Ukaji, Masaya; Inaba, Junichi (Matsushita Electric
Industrial Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2004127744
A2 20040422, 12 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP
2002-290904 20021003.

AB The integrated thermoelec. cell-thin film **battery** has a
stack of power generating section and thermoelec. cell section
formed on continuous film, where the power generating section has a
stack contg. a **cathode**, a solid electrolyte, and an anode
and the thermoelec. element uses the heat generated by the
battery to produce electricity to charge the **battery**

IT **7440-44-0**, Carbon, uses **10377-52-3**, Lithium
phosphate (**Li3PO4**) **12190-79-3**, Cobalt lithium
oxide (**CoLiO2**)
(thin film secondary lithium **batteries** with integrated
thermoelec. elements for charging **battery** with
battery waste heat)

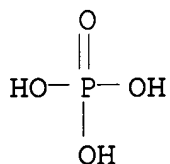
RN 7440-44-0 HCA

CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

RN 10377-52-3 HCA

CN Phosphoric acid, trilithium salt (8CI, 9CI) (CA INDEX NAME)



●3 Li

RN 12190-79-3 HCA

CN Cobalt lithium oxide (CoLiO₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IC ICM H01M010-39

ICS H01L035-30; H01L035-34; H01M010-40; H02N011-00

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST thermoelec element thin film **battery** integration

IT Secondary **batteries**

(lithium; thin film secondary lithium **batteries** with integrated thermoelec. cells for charging **battery** with **battery** waste heat)

IT Thermoelectric devices

(thin film secondary lithium **batteries** with integrated thermoelec. elements for charging **battery** with **battery** waste heat)

IT 7631-86-9, Silica, uses

(insulation film; thin film secondary lithium **batteries** with integrated thermoelec. elements for charging **battery** with **battery** waste heat)

IT 1304-82-1, Bismuth telluride (Bi₂Te₃) 7440-44-0, Carbon, uses 10377-52-3, Lithium phosphate (Li₃PO₄)

12190-79-3, Cobalt lithium oxide (CoLiO₂) 13453-84-4, Lithium silicate (Li₄SiO₄) 31501-07-2, Antimony bismuth telluride (Sb₃BiTe₆)

(thin film secondary lithium **batteries** with integrated thermoelec. elements for charging **battery** with **battery** waste heat)

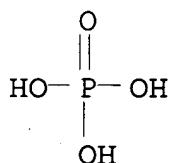
140:273561 Solid state **battery** and its manufacture. Higuchi, Hiroshi; Ukaji, Masaya; Ito, Shuji; Honda, Kazuyoshi; Takai, Yoriko; Okazaki, Sadayuki; Sakai, Hitoshi; Inaba, Junichi (Matsushita Electric Industrial Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2004095342 A2 20040325, 23 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2002-254962 20020830.

AB The **battery** has a stack contg. layers of **cathode** active mass, solid electrolyte, anode active mass, and collector; where the electrolyte has at least a layer contg. Li⁺ conducting inorg. solid electrolyte and an org. polymer. The **battery** is prepd. by forming the solid electrolyte layer on the surface of **cathode** active mass layers and anode active mass layers in an atm. contg. the atoms, ions, or clusters of the electrolyte components and the polymer or its monomer or a low mol. wt. polymer.

IT 10377-52-3, Lithium phosphate (**Li₃PO₄**)
(compns. and manuf. of solid lithium conducting electrolytes contg. org. polymers for secondary lithium **batteries**)

RN 10377-52-3 HCA

CN Phosphoric acid, trilithium salt (8CI, 9CI) (CA INDEX NAME)



●3 Li

IT 7782-42-5, **Graphite**, processes 12190-79-3
, Cobalt lithium oxide (CoLiO₂)
(deposition of solid lithium conducting electrolytes contg. org. polymers on electrodes for secondary lithium **batteries**)

RN 7782-42-5 HCA

CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

RN 12190-79-3 HCA

CN Cobalt lithium oxide (CoLiO₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2

Co		1		7440-48-4
Li		1		7439-93-2

IC ICM H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST solid state lithium **battery** structure manuf
 IT **Battery** electrolytes
 (compns. and manuf. of solid lithium conducting electrolytes
 contg. org. polymers for secondary lithium **batteries**)
 IT Polyesters, uses
 (compns. and manuf. of solid lithium conducting electrolytes
 contg. org. polymers for secondary lithium **batteries**)
 IT Secondary **batteries**
 (lithium; manuf. of secondary solid state lithium
 batteries)
 IT Polyketones
 (polyether-; compns. and manuf. of solid lithium conducting
 electrolytes contg. org. polymers for secondary lithium
 batteries)
 IT Polyethers, uses
 (polyketone-; compns. and manuf. of solid lithium conducting
 electrolytes contg. org. polymers for secondary lithium
 batteries)
 IT 75-21-8D, Ethylene oxide, polymer with trifluorosulfonimides
 1314-62-1, Vanadium pentoxide, uses 7631-86-9, Silica, uses
 9002-88-4, Polyethylene 9016-80-2, Polymethylpentene
 10377-52-3, Lithium phosphate (**Li3PO4**)
 12057-24-8, Lithium oxide, uses 12136-58-2, Lithium sulfide
 13759-10-9, Silicon disulfide 25038-59-9, Poly(ethylene
 terephthalate), uses 668998-68-3, Lithium phosphorus nitride oxide
 (LiPNO)
 (compns. and manuf. of solid lithium conducting electrolytes
 contg. org. polymers for secondary lithium **batteries**)
 IT 7439-93-2, Lithium, processes **7782-42-5**, **Graphite**
 , processes 12031-65-1, Lithium nickel oxide (LiNiO2)
 12057-17-9, Lithium manganese oxide (LiMn2O4) **12190-79-3**,
 Cobalt lithium oxide (CoLiO2) 674333-73-4D, Cobalt lithium nitride
 (Co3Li3N), lithium deficient
 (deposition of solid lithium conducting electrolytes contg. org.
 polymers on electrodes for secondary lithium **batteries**)
 L70 ANSWER 12 OF 36 HCA COPYRIGHT 2006 ACS on STN
 140:238481 Lithium vanadium oxide thin-film **battery**.
 Neudecker, Bernd J.; Lanning, Bruce; Benson, Martin H.; Armstrong,
 Joseph H. (USA). U.S. Pat. Appl. Publ. US 2004048157 A1 20040311,
 30 pp. (English). CODEN: USXXCO. APPLICATION: US 2002-238905
 20020911.
 AB The manuf. and use of **multilayer** thin-film

batteries, such as inverted lithium-free **batteries** is explained. The present invention provides a **battery** that may include a lithium vanadium oxide $\text{Li}_x\text{V}_2\text{O}_y$ ($0 < x \leq 100$, $0 < y \leq 5$) pos. **cathode** or neg. anode. The present invention may also provide for a thin-film **battery** that may be formed on a wide variety of substrate materials and geometries.

IT 1344-28-1, Aluminum oxide, uses
(barrier layer; lithium vanadium oxide thin-film **battery**)

RN 1344-28-1 HCA

CN Aluminum oxide (Al_2O_3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

IT 7440-44-0, Diamond-like carbon, uses
(diamond-like, barrier layer; lithium vanadium oxide thin-film **battery**)

RN 7440-44-0 HCA

CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

IT 12031-95-7, Lithium titanium oxide
 $\text{Li}_4\text{Ti}_5\text{O}_{12}$ 12190-79-3, Cobalt lithium oxide CoLiO_2
(lithium vanadium oxide thin-film **battery**)

RN 12031-95-7 HCA

CN Lithium titanium oxide ($\text{Li}_4\text{Ti}_5\text{O}_{12}$) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	12	17778-80-2
Ti	5	7440-32-6
Li	4	7439-93-2

RN 12190-79-3 HCA

CN Cobalt lithium oxide (CoLiO_2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IT 7782-42-5, Graphite, uses
(support; lithium vanadium oxide thin-film **battery**)

RN 7782-42-5 HCA

CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

IC ICM H01M004-48
ICS H01M004-66; B05D005-12
INCL 429231200; 429231500; 429245000; 029623500; 427126300
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST lithium vanadium oxide thin film **battery**
IT Electric arc
(**cathodic**, deposition; lithium vanadium oxide thin-film **battery**)
IT Vapor deposition process
(chem.; lithium vanadium oxide thin-film **battery**)
IT Sputtering
(diode, reactive and nonreactive; lithium vanadium oxide thin-film **battery**)
IT Vapor deposition process
(electron-beam, reactive and nonreactive; lithium vanadium oxide thin-film **battery**)
IT Plasma
(evapn. assisted by; lithium vanadium oxide thin-film **battery**)
IT Vapor deposition process
(ion plating, plasma assisted; lithium vanadium oxide thin-film **battery**)
IT **Battery anodes**
Battery cathodes
Molecular beam epitaxy
Primary **batteries**
(lithium vanadium oxide thin-film **battery**)
IT Vapor deposition process
(photochem.; lithium vanadium oxide thin-film **battery**)
IT Vapor deposition process
(plasma, electron-beam directed, reactive and nonreactive; lithium vanadium oxide thin-film **battery**)
IT Alcohols, uses
(polyhydric, support; lithium vanadium oxide thin-film **battery**)
IT Laser radiation
(pulsed, deposition; lithium vanadium oxide thin-film **battery**)
IT Electron beam evaporation
Magnetron sputtering
(reactive and nonreactive; lithium vanadium oxide thin-film **battery**)
IT Ceramics

Semiconductor materials

(support; lithium vanadium oxide thin-film **battery**)

IT Alloys, uses

Glass, uses

Metals, uses

Polyamides, uses

Polycarbonates, uses

Polyesters, uses

Polyimides, uses

Polysiloxanes, uses

Polyurethanes, uses

Rubber, uses

(support; lithium vanadium oxide thin-film **battery**)

IT Evaporation

(thermal, reactive and nonreactive; lithium vanadium oxide thin-film **battery**)

IT Vapor deposition process

(vacuum; lithium vanadium oxide thin-film **battery**)

IT 1344-28-1, Aluminum oxide, uses

7631-86-9, Silica, uses 11104-85-1, Molybdenum silicide

11105-01-4, Silicon nitride oxide 11115-87-0, Hafnium nitride

11116-16-8, Titanium nitride 11116-19-1, Yttrium carbide

11116-21-5, Yttrium nitride 11129-37-6, Hafnium carbide

11130-49-7, Chromium carbide 11130-73-7, Tungsten carbide

12007-23-7, Hafnium boride 12033-62-4, Tantalum nitride (TaN)

12033-89-5, Silicon nitride, uses 12069-94-2, Niobium carbide

12070-08-5, Titanium carbide 12070-10-9, Vanadium carbide (VC)

12070-14-3, Zirconium carbide (ZrC) 12626-44-7, Chromium silicide

12626-91-4, Molybdenum boride 12627-39-3, Tungsten boride

12627-41-7, Tungsten silicide 12627-57-5, Molybdenum carbide

12633-97-5, Aluminum nitride oxide 12648-34-9, Niobium nitride

12653-55-3, Chromium boride 12653-77-9, Niobium boride

12653-85-9, Tantalum boride 12653-88-2, Vanadium boride

12673-91-5, Titanium boride 12674-04-3, Vanadium nitride

12705-37-2, Chromium nitride 12738-91-9, Titanium silicide

12741-10-5, Zirconium boride 24304-00-5, Aluminum nitride

37189-51-8, Zirconium silicide 37245-81-1, Molybdenum nitride

37271-26-4, Titanium nitride oxide 37359-53-8, Tungsten nitride

39336-13-5, Niobium silicide 51680-51-4, Tantalum carbide

52037-56-6, Vanadium silicide 53801-50-6, Yttrium boride

60304-33-8, Hafnium silicide 102427-06-5, Yttrium silicide

107992-37-0, Silicon carbide (SiC) 113443-18-8, Silicon

monoxide 119173-61-4, Zirconium nitride 184905-46-2, Lithium

nitrogen phosphorus oxide

(barrier layer; lithium vanadium oxide thin-film **battery**)

)

IT 7440-50-8, Copper, uses 12054-11-4, Cusn 12597-68-1, Stainless
steel, uses 12767-50-9, Phosphor bronze

(current collector; lithium vanadium oxide thin-film
battery)

- IT 7440-44-0, Diamond-like carbon, uses
(diamond-like, barrier layer; lithium vanadium oxide thin-film
battery)
- IT 1333-74-0, Hydrogen, uses 7429-90-5, Aluminum, uses 7439-89-6,
Iron, uses 7439-91-0, Lanthanum, uses 7439-92-1, Lead, uses
7439-95-4, Magnesium, uses 7439-96-5, Manganese, uses 7439-98-7,
Molybdenum, uses 7440-02-0, Nickel, uses 7440-03-1, Niobium,
uses 7440-09-7, Potassium, uses 7440-17-7, Rubidium, uses
7440-20-2, Scandium, uses 7440-21-3, Silicon, uses 7440-23-5,
Sodium, uses 7440-24-6, Strontium, uses 7440-25-7, Tantalum,
uses 7440-28-0, Thallium, uses 7440-31-5, Tin, uses 7440-32-6,
Titanium, uses 7440-33-7, Tungsten, uses 7440-36-0, Antimony,
uses 7440-38-2, Arsenic, uses 7440-39-3, Barium, uses
7440-41-7, Beryllium, uses 7440-45-1, Cerium, uses 7440-46-2,
Cesium, uses 7440-47-3, Chromium, uses 7440-48-4, Cobalt, uses
7440-55-3, Gallium, uses 7440-56-4, Germanium, uses 7440-58-6,
Hafnium, uses 7440-65-5, Yttrium, uses 7440-66-6, Zinc, uses
7440-67-7, Zirconium, uses 7440-69-9, Bismuth, uses 7440-70-2,
Calcium, uses 7440-74-6, Indium, uses 7723-14-0, Phosphorus,
uses
(dopant; lithium vanadium oxide thin-film **battery**)
- IT 1314-34-7, Vanadium trioxide 15060-59-0, Lithium vanadium oxide
livo3 15593-56-3, Lithium vanadium oxide li3vo4
(lithium vanadium oxide thin-film **battery**)
- IT 1313-13-9, Manganese dioxide, uses 1314-62-1, Vanadium oxide
(V2O5), uses 7439-88-5, Iridium, uses 7440-05-3, Palladium, uses
7440-06-4, Platinum, uses 7440-22-4, Silver, uses 7440-42-8,
Boron, uses 7440-43-9, Cadmium, uses 7440-57-5, Gold, uses
10045-86-0, Iron phosphate fepo4 11126-15-1, Lithium vanadium
oxide 12017-95-7, Chromium lithium manganese oxide CrLiMnO4
12031-65-1, Lithium nickel oxide linio2 12031-95-7,
Lithium **titanium oxide li4ti5o12**
12036-21-4, Vanadium oxide vo2 12037-42-2, Vanadium oxide v6o13
12039-13-3, Titanium disulfide 12057-17-9, Lithium manganese oxide
limn2o4 12190-79-3, Cobalt lithium oxide colio2
12359-27-2, Vanadyl phosphate 14024-11-4, Aluminum lithium
chloride allicl4 15365-14-7, Iron lithium phosphate felipo4
39457-42-6, Lithium manganese oxide 55326-82-4, Lithium titanium
sulfide litis2 66102-93-0, Cobalt lithium nitride 83348-01-0,
Lithium vanadyl phosphate LiVOPO4 131500-40-8, Tin nitride oxide
silicide 144769-06-2, Lead oxide PbO0-2 170171-06-9, Aluminum
lithium fluoride allif4 199923-81-4, Aluminum cobalt lithium oxide
(Al,Co)LiO2 258511-25-0, Lithium manganese nitride
268747-59-7, Chromium manganese oxide Cr0.5Mn0.5O2 371148-86-6,
Tin oxide SnO0-2 666836-39-1, Tin nitride (SnN0-1.33)
666836-40-4, Indium nitride (InN0-1) 666836-41-5, Zinc nitride

(ZnNO-0.67) 666836-42-6, Copper nitride (CuNO-0.33) 666836-43-7,
Nickel nitride (NiNO-0.33) 666836-44-8, Indium oxide (InO-1.5)
(lithium vanadium oxide thin-film **battery**)

IT 7782-42-5, **Graphite**, uses
(support; lithium vanadium oxide thin-film **battery**)

IT 7439-93-2, Lithium, processes 7440-62-2, Vanadium, processes
12031-80-0, Lithium oxide Li_2O 12057-24-8, Lithium oxide (Li_2O),
processes 26134-62-3, Lithium nitride (Li_3N)
(target material; lithium vanadium oxide thin-film
battery)

L70 ANSWER 13 OF 36 HCA COPYRIGHT 2006 ACS on STN

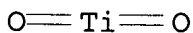
140:202430 Salts of pentacyclic or tetrapentalene derived anions, and
their uses as ionic conductive materials. Armand, Michel; Michot,
Christophe; Gauthier, Michel; Choquetté, Yves (Hydro-Quebec, Can.;
Centre National De La Recherche Scientifique (CNRS)). Eur. Pat.
Appl. EP 1391952 A2 20040225, 33 pp. DESIGNATED STATES: R: DE, FR,
GB, IT. (French). CODEN: EPXXDW. APPLICATION: EP 2003-292436
19971230. PRIORITY: CA 1996-2194127 19961230; CA 1997-2199231
19970305; EP 1997-403188 19971230.

AB This invention describes ionic compds. where the anionic charge is
delocalized. One compd. of the invention contains an anionic part
assocd. with at least one mono- or multivalent cationic part M^m+ , in
a no. sufficient to ensure electronic neutrality of the material. M
can be a hydronium, nitrosyl NO^+ , an ammonium NH_4^+ , a metallic
cation with valence m, an org. cation having a valence m, or an
organometallic cation having valence m. The anionic charge is
carried by a new pentacyclic moiety or deriv. of tetrapentalene
carrying electroattractive substituents. The compds. are used
notably for ionic conduction, electronic conductors, dyes and
colorants, and catalysts for diverse chem. reactions. They can also
be used as **electrolytes** in fuel **cells** and
batteries.

IT 13463-67-7, **Titanium dioxide**, uses
(nanoparticles; salts of pentacyclic or tetrapentalene derived
anions, and their uses as ionic conductive materials)

RN 13463-67-7 HCA

CN Titanium oxide (TiO_2) (8CI, 9CI) (CA INDEX NAME)



IT 131344-56-4, Cobalt lithium nickel oxide 162684-16-4
, Lithium manganese nickel oxide
(**pos. electrode**; salts of pentacyclic or
tetrapentalene derived anions, and their uses as ionic conductive
materials)

RN 131344-56-4 HCA

CN Cobalt lithium nickel oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Co	x	7440-48-4
Ni	x	7440-02-0
Li	x	7439-93-2

RN 162684-16-4 HCA

CN Lithium manganese nickel oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Ni	x	7440-02-0
Mn	x	7439-96-5
Li	x	7439-93-2

IT 12190-79-3, Cobalt lithium oxide (CoLiO₂)
(salts of pentacyclic or tetrapentalene derived anions, and their
uses as ionic conductive materials)

RN 12190-79-3 HCA

CN Cobalt lithium oxide (CoLiO₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IC ICM H01M006-16

ICS H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 27, 28, 29, 35, 76

ST pentacyclic tetrapentalene salt charge delocalized anion ionic
conduction; alkali alk earth transition metal salt heterocyclic
electrolyte polymer; **electrochem cell** fuel
polyelectrolyte cond soly catalysis fluoropolymer polysiloxane

IT Spinel-type crystals
(Li_yMn_{1-x}MxO₂, **pos. electrode**; salts of
pentacyclic or tetrapentalene derived anions, and their uses as
ionic conductive materials)

IT **Carbon black**, uses
(composite electrodes with soft polymer or **LiCoO₂** and

polymer gel electrolytes, or with acetylene black, VO₂ and PEO; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Lithiation

(during **battery** operation; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Polyoxyalkylenes, processes

(electrolyte complexes with lithium salts, **carbon blacks**, (1,2,3-triazolium) ionic liqs., and other materials; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Textiles

(**laminated**, polyelectrolyte composite membrane perfluorinated sulfonylpyrazole-contg. polymer; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Cyclic voltammetry

(of **secondary battery cells** with polymer gel electrolytes; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Polysulfides

(org., **pos. electrode**; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Olivine-group minerals

(**pos. electrode**; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Secondary **batteries**

(salts of pentacyclic or tetrapentalene derived anions for use in; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 12036-21-4, Vanadium dioxide

(**battery** electrode composites with acetylene black and PEO; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 210469-97-9P

(composite electrodes with LiCoO₂ and **carbon black**; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 25322-68-3, Polyethylene oxide

(electrolyte complexes with lithium salts, **carbon blacks**, (1,2,3-triazolium) ionic liqs., and other materials; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 7429-90-5, Aluminum, uses

(in **electrochem. cells**, and corrosion of;

salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

- IT 13463-67-7, **Titanium dioxide**, uses
(nanoparticles; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
- IT 1317-37-9, Iron sulfide (FeS) 10028-22-5, Iron sulfate (Fe₂(SO₄)₃)
11099-11-9, Vanadium oxide 12068-85-8, Iron disulfide (FeS₂)
12423-04-0, Lithium vanadium oxide (LiV₃O₈) 61179-01-9, Aluminum
lithium manganese oxide 131344-56-4, Cobalt lithium nickel
oxide 133782-19-1, Lithium manganese vanadium oxide
162684-16-4, Lithium manganese nickel oxide 204450-96-4,
Chromium lithium manganese oxide
(**pos. electrode**; salts of pentacyclic or
tetrapentalene derived anions, and their uses as ionic conductive
materials)
- IT 12190-79-3, Cobalt lithium oxide (CoLiO₂)
(salts of pentacyclic or tetrapentalene derived anions, and their
uses as ionic conductive materials)

L70 ANSWER 14 OF 36 HCA COPYRIGHT 2006 ACS on STN

140:184700 Secondary lithium **battery** and its **cathode**

. Tanjo, Yuji (Nissan Motor Co., Ltd., Japan). Jpn. Kokai Tokkyo
Koho JP 2004055328 A2 20040219, 12 pp. (Japanese). CODEN: JKXXAF.
APPLICATION: JP 2002-210958 20020719.

- AB The **battery** has ≥1 Li contg. multiple oxide
cathodes, ≥1 Li intercalating **carbonaceous**
anodes, separators between the **cathodes** and anodes, and a
Li⁺ conducting electrolyte soln.; where the **cathode** active
mass is a Li contg. multiple oxide, selected from Li Mn oxide, Li Ni
oxide, Li Co oxide, Li Fe P oxide, and Li Mn P oxide and has av.
particle diam. ≤1 μm. Preferably, the **cathodes**
contain ≥20% conductor and are 50-150 μm thick.

- IT 52627-24-4, Cobalt lithium oxide 223571-46-8, Iron
lithium phosphorus oxide
(fine lithium contg. multiple oxide particles with controlled
particle size for secondary lithium **battery**
cathodes)

RN 52627-24-4 HCA

CN Cobalt lithium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====+=====+=====		
O	x	17778-80-2
Co	x	7440-48-4
Li	x	7439-93-2

RN 223571-46-8 HCA

CN Iron lithium phosphorus oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
P	x	7723-14-0
Li	x	7439-93-2
Fe	x	7439-89-6

IC ICM H01M004-58

ICS H01M004-02; H01M004-62; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary lithium **battery** multiple oxide **cathode**IT **Battery cathodes**

(lithium contg. multiple oxide **cathodes** with controlled thickness and oxide particle size for secondary **batteries**)

IT 12057-17-9, Lithium manganese oxide (LiMn₂O₄) 39300-70-4, Lithium nickel oxide **52627-24-4**, Cobalt lithium oxide 138758-08-4, Lithium manganese phosphorus oxide **223571-46-8**, Iron lithium phosphorus oxide (fine lithium contg. multiple oxide particles with controlled particle size for secondary lithium **battery cathodes**)

L70 ANSWER 15 OF 36 HCA COPYRIGHT 2006 ACS on STN

140:131187 Rechargeable lithium **electrochemical cell**

. Besenhard, Jurgen Otto; Moller, Kai Christian; Fauler, Gisela; Winter, Martin (LG Chem., Ltd., Austria). U.S. Pat. Appl. Publ. US 2004029017 A1 20040212, 8 pp. (English). CODEN: USXXCO. APPLICATION: US 2002-217319 20020812.

AB A secondary **battery** is comprised of a **pos. electrode**, a neg. electrode formed from a lithium storage material, and a nonaq. electrolyte. The nonaq. electrolyte includes a lithium salt, nonaq. aprotic solvent(s), such as ethylene carbonate, propylene carbonate, di-Me carbonate, ethymethyl carbonate and di-Et carbonate, and a small percentage of at least one org. additive. The neg. electrode may comprise a carbon such as **graphite**, and the **pos. electrode** may comprise a lithiated metal oxide or phosphate, such as **LiCoO₂**, **LiNiO₂**, **LiMn₂O₄**, **LiFePO₄**, or mixts. thereof. The org. additives have one or more unsatd. bonds activated with respect to oxidn. by electron-pushing alkyl groups. They are in most cases known to be able to undergo polymn. reactions, such as an anodically induced polymn. esp. under certain conditions. The additives are oxidized at the **cathode** at a potential of more than 4.3 V vs. Li/Li⁺. With these additives in

amts. of 0.001 to 10%, a passivation layer is formed on the **cathodes**, and the sensitiveness of the **battery** against overcharge is reduced. The electrolyte mixts. do not deteriorate the properties of the **battery** anodes.

IT 7440-44-0, Carbon, uses
(**graphitic**; rechargeable lithium **electrochem.**
cell)

RN 7440-44-0 HCA

CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

IT 7782-42-5, **Graphite**, uses 52627-24-4,
Cobalt lithium oxide
(rechargeable lithium **electrochem. cell**)

RN 7782-42-5 HCA

CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

RN 52627-24-4 HCA

CN Cobalt lithium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Co	x	7440-48-4
Li	x	7439-93-2

IC ICM H01M004-58

ICS H01M010-40

INCL 429326000; 429231800; 429330000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 72

ST lithium secondary **battery** electrolyte additive

IT Transition metal oxides
(lithiated; rechargeable lithium **electrochem.**
cell)

IT Secondary **batteries**
(lithium; rechargeable lithium **electrochem.**
cell)

IT **Carbon black**, uses
Fluoropolymers, uses
Fluoropolymers, uses
Unsaturated compounds

- (rechargeable lithium **electrochem. cell**)
- IT 7440-44-0, Carbon, uses
(**graphitic**; rechargeable lithium **electrochem. cell**)
- IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate
108-32-7, Propylene carbonate 623-53-0, Ethylmethyl carbonate
7440-32-6, Titanium, uses 7782-42-5, **Graphite**,
uses 7791-03-9, Lithium perchlorate 11113-67-0, Iron lithium
oxide 12057-17-9, Lithium manganese oxide LiMn_2O_4 21324-40-3,
Lithium hexafluorophosphate 39300-70-4, Lithium nickel oxide
39457-42-6, Lithium manganese oxide 52627-24-4, Cobalt
lithium oxide 90076-65-6
(rechargeable lithium **electrochem. cell**)
- IT 100-40-3, 4-Vinylcyclohexene 110-83-8, Cyclohexene, uses
592-42-7, 1,5-Hexadiene 24937-79-9, PvdF
(rechargeable lithium **electrochem. cell**)
- L70 ANSWER 16 OF 36 HCA COPYRIGHT 2006 ACS on STN
140:96902 Procedure for the fabrication of rechargeable lithium polymer
batteries. Naarmann, Herbert; Kruger, Franz Josef (Dilo
Trading A.-G., Switz.). Ger. Offen. DE 10231319 A1 20040122, 11 pp.
(German). CODEN: GWXXBX. APPLICATION: DE 2002-10231319 20020711.
- AB Li polymer **batteries** were fabricated by a special
procedure, new concepts, and with new components. The
battery consists of anode, **cathode** and polymer
electrolyte as separator, whereby the active masses are degassed and
the used **graphites** for the anode masses were preferably
modified by reaction with metal alkyls (e.g., with LiBu). The
procedure according to invention is based on the coating and
extrusion technol. with which all necessary components for the resp.
electrodes and the separator are present as brushable, coatable
and/or extrudable mixts. with solvent, conducting salt, additives
and the active components (Li intercalating carbon or Li
intercalating heavy metal oxides) and are processed during a
continuous, preferably single-stage process, whereby monomers are
polymd. and solidified. The mixts. are dispersions and/or brushable
pastes, which are applied at room temp. on the collector (e.g. Cu
film), coated with the anode mass (15-40 μm), then with the
separator, the **cathode** mass applied (15-40 μm) and
finally **cathode** grid aluminum film. The developed
connector system is **laminated** and wound, and encapsulated.
- IT 7782-42-5, **Graphite**, uses 39302-37-9,
Lithium **titanium oxide** 52627-24-4,
Cobalt lithium oxide
(procedure for fabrication of rechargeable lithium polymer
batteries)
- RN 7782-42-5 HCA
CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

RN 39302-37-9 HCA
 CN Lithium titanium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Ti	x	7440-32-6
Li	x	7439-93-2

RN 52627-24-4 HCA
 CN Cobalt lithium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Co	x	7440-48-4
Li	x	7439-93-2

IT 1309-48-4, **Magnesia**, uses 1344-28-1,
Alumina, uses
 (procedure for fabrication of rechargeable lithium polymer
batteries)

RN 1309-48-4 HCA
 CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)

Mg=O

RN 1344-28-1 HCA
 CN Aluminum oxide (Al₂O₃) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

IC ICM H01M010-02

ICS H01M004-36; H01M004-62

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 38, 76

ST **battery** lithium secondary fabrication

IT Optical imaging devices

(electrophoretic; procedure for fabrication of rechargeable
 lithium polymer **batteries**)

IT Glycols, uses

(ethers; procedure for fabrication of rechargeable lithium
 polymer **batteries**)

- IT Ethers, uses
(glycol; procedure for fabrication of rechargeable lithium polymer **batteries**)
- IT Fibers
(hollow; procedure for fabrication of rechargeable lithium polymer **batteries**)
- IT Secondary **batteries**
(lithium; procedure for fabrication of rechargeable lithium polymer **batteries**)
- IT Carbon fibers, uses
(nanofibers; procedure for fabrication of rechargeable lithium polymer **batteries**)
- IT Electrophoresis apparatus
(optical imaging; procedure for fabrication of rechargeable lithium polymer **batteries**)
- IT Perfluoro compounds
(perfluoroalkyl ethers; procedure for fabrication of rechargeable lithium polymer **batteries**)
- IT Ethers, uses
(perfluoroalkyl; procedure for fabrication of rechargeable lithium polymer **batteries**)
- IT Diodes
Sensors
(procedure for fabrication of rechargeable lithium polymer **batteries**)
- IT Polyacetylenes, uses
(procedure for fabrication of rechargeable lithium polymer **batteries**)
- IT Butyl rubber, uses
(procedure for fabrication of rechargeable lithium polymer **batteries**)
- IT Polyolefins
(procedure for fabrication of rechargeable lithium polymer **batteries**)
- IT Styrene-butadiene rubber, uses
(procedure for fabrication of rechargeable lithium polymer **batteries**)
- IT 9010-85-9
(butyl rubber, procedure for fabrication of rechargeable lithium polymer **batteries**)
- IT 9003-17-2
(of 1,2-configuration; procedure for fabrication of rechargeable lithium polymer **batteries**)
- IT 109-72-8, Lithium butyl, processes
(procedure for fabrication of rechargeable lithium polymer **batteries**)
- IT 463-79-6D, Carbonic acid, alkyl salt 1321-74-0, Divinylbenzene, uses 7429-90-5, Aluminum, uses 7440-50-8, Copper, uses

7782-42-5, Graphite, uses 7791-03-9, Lithium perchlorate 9011-17-0, Kynar 2801 9033-83-4, Polyphenylene 11126-15-1, Lithium vanadium oxide 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 25067-58-7, Polyacetylene 30604-81-0, Polypyrrole 37296-91-6, Lithium molybdenum oxide 37349-20-5, Lithium tungsten oxide 39300-70-4, Lithium nickel oxide 39302-37-9, Lithium titanium oxide 39457-42-6, Lithium manganese oxide 51177-06-1, Chromium lithium oxide 51222-70-9, Lithium zirconium oxide 52627-24-4, Cobalt lithium oxide

(procedure for fabrication of rechargeable lithium polymer batteries)

IT 1304-28-5, Baria, uses 1309-48-4, Magnesia, uses 1318-00-9, Vermiculite 1344-28-1, Alumina, uses 7631-86-9, Silica, uses 9002-88-4, Polyethylene 9003-29-6, Polybutene 9003-55-8, Styrene-butadiene copolymer 12627-14-4, Lithium silicate 13453-69-5, Lithium metaborate 18115-70-3, Lithium acetylacetonate, uses 24968-97-6, Polypyrrolidone (procedure for fabrication of rechargeable lithium polymer batteries)

IT 7440-37-1, Argon, uses (procedure for fabrication of rechargeable lithium polymer batteries)

IT 9003-55-8 (styrene-butadiene rubber, procedure for fabrication of rechargeable lithium polymer batteries)

L70 ANSWER 17 OF 36 HCA COPYRIGHT 2006 ACS on STN

139:263201 The role of **carbon black** distribution in **cathodes** for Li ion batteries. Dominko, Robert; Gaberscek, Miran; Drogenik, Jernej; Bele, Marjan; Pejovnik, Stane; Jamnik, Janko (National Institute of Chemistry, Ljubljana, SI-1000, Slovenia). Journal of Power Sources, 119-121, 770-773 (English) 2003. CODEN: JPSODZ. ISSN: 0378-7753. Publisher: Elsevier Science B.V..

AB The influence of **carbon black** distribution/arrangement in **cathode** composite on **cathode** performance is studied using three types of active materials: LiMn_2O_4 spinel, LiCoO_2 , and LiFePO_4 . **Carbon black** is added to the active materials in two different ways: (a) using a conventional mixing procedure and (b) using a novel coating technol. invented in our lab. Different technologies yield different arrangement (distribution) of **carbon black** around active particles. It is shown that the uniformity of **carbon black** distribution affects significantly the **cathode** kinetics, regardless of the type of active particles used. A simple model explaining the influence of **carbon black** distribution on

cathode kinetics is presented.

IT 12190-79-3, Cobalt lithium oxide (CoLiO₂)
 (cathode; role of **carbon black**
 distribution in **cathodes** for lithium-ion
batteries)
 RN 12190-79-3 HCA
 CN Cobalt lithium oxide (CoLiO₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST **carbon black** distribution **cathode**
 lithium ion **battery**
 IT **Battery cathodes**
 (role of **carbon black** distribution in
cathodes for lithium-ion **batteries**)
 IT **Carbon black**, uses
 (role of **carbon black** distribution in
cathodes for lithium-ion **batteries**)
 IT 12057-17-9, Lithium manganese oxide (LiMn₂O₄) 12190-79-3,
 Cobalt lithium oxide (CoLiO₂) 15365-14-7, Iron lithium phosphate
 (FeLiPO₄)
 (cathode; role of **carbon black**
 distribution in **cathodes** for lithium-ion
batteries)
 IT 7439-93-2, Lithium, uses
 (role of **carbon black** distribution in
cathodes for lithium-ion **batteries**)

L70 ANSWER 18 OF 36 HCA COPYRIGHT 2006 ACS on STN

139:216870 Cycling performance of low-cost lithium ion **batteries**
 with natural **graphite** and **LiFePO₄**. Shim,
 Joongpyo; Striebel, Kathryn A. (Environmental Energy Technologies
 Division, Lawrence Berkeley National Laboratory, Berkeley, CA,
 94720, USA). Journal of Power Sources, 119-121, 955-958 (English)
 2003. CODEN: JPSODZ. ISSN: 0378-7753. Publisher: Elsevier
 Science B.V..

AB Low-cost lithium-ion **batteries** with **LiFePO₄**
cathode and natural **graphite** anode were cycled in
 electrolyte contg. 1M LiBF₄, ethylene carbonate, and di-Et carbonate
 at 100% depth of discharge and 25° in order to investigate
 cycle performance and diagnostics for capacity fading. The 12 cm²
 pouch cell showed 65% of capacity retention at 5C compared to that

at C/25. The cell showed 80% of initial capacity after 80 cycles and its capacity fade rate was 11.3 $\mu\text{A-h/cycle}$ during const. C/2 cycling. In hybrid pulse power characterization, the discharge resistance of this cell was higher than com. **graphite/LiCoO₂** cell because of low lithium diffusivity in **LiFePO₄**. Slow rate cycling in pouch full cell showed almost 40% of capacity fade after 100 cycles. However, the **cathode** and anode after 100 cycles did not show any capacity fading in half-cell test after disassembling full cell, suggesting that capacity fade in the full cell is caused by loss of cyclable Li.

IT 7782-42-5, **Graphite**, uses

(anode; cycling performance of low-cost lithium-ion **batteries** with natural **graphite** anode and lithium iron phosphate **cathode**)

RN 7782-42-5 HCA

CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium ion **battery** performance; **graphite** anode

lithium ion **battery** performance; iron lithium phosphate **cathode battery** performance

IT Secondary **batteries**

(cycling performance of low-cost lithium-ion **batteries** with natural **graphite** anode and lithium iron phosphate **cathode**)

IT 7782-42-5, **Graphite**, uses

(anode; cycling performance of low-cost lithium-ion **batteries** with natural **graphite** anode and lithium iron phosphate **cathode**)

IT 15365-14-7, Iron lithium phosphate (FeLiPO₄)

(**cathode**; cycling performance of low-cost lithium-ion **batteries** with natural **graphite** anode and lithium iron phosphate **cathode**)

L70 ANSWER 19 OF 36 HCA COPYRIGHT 2006 ACS on STN

139:182871 Polymer lithium **battery** with ionic electrolyte.

Huang, Sui-Yang (USA). U.S. Pat. Appl. Publ. US 2003157409 A1 20030821, 10 pp. (English). CODEN: USXXCO. APPLICATION: US 2003-368926 20030218. PRIORITY: US 2002-358593P 20020221.

AB There is disclosed a novel rechargeable lithium **battery** with ionic electrolyte. The embodiments for the new polymer lithium ion **batteries** in the present invention comprise three major components, each of which is a composite: an anode, a **cathode**, and a polymer-gel-electrolyte-separator system. The anode consists of a lithium ion host such as **graphite**

as active materials. The **cathode** is a mixt. of lithium compds., high surface area carbon and sometimes a catalyst. The polymer-gel-electrolyte-separator system comprises inorg. electrolyte as active material, which is immobilized in the polymer matrix. Two chemistries involved in these embodiments of **batteries** include intercalation of lithium ions and catalyzed electrolysis of lithium compds.

IT 7440-44-0, Activated carbon, uses
(activated; polymer lithium **battery** with ionic electrolyte)

RN 7440-44-0 HCA

CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

IT 1344-28-1, Alumina, uses 13463-67-7,
Titania, uses
(filler; polymer lithium **battery** with ionic electrolyte)

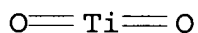
RN 1344-28-1 HCA

CN Aluminum oxide (Al₂O₃) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

RN 13463-67-7 HCA

CN Titanium oxide (TiO₂) (8CI, 9CI) (CA INDEX NAME)



IT 7782-42-5, Graphite, uses 10377-52-3,
Trilithium phosphate 12190-79-3, Cobalt lithium oxide
colio₂
(polymer lithium **battery** with ionic electrolyte)

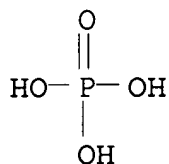
RN 7782-42-5 HCA

CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

RN 10377-52-3 HCA

CN Phosphoric acid, trilithium salt (8CI, 9CI) (CA INDEX NAME)



●3 Li

RN 12190-79-3 HCA

CN Cobalt lithium oxide (CoLiO₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IC ICM H01M010-40

ICS H01M004-58; H01M004-62; H01M004-66; H01M004-50; H01M004-52

INCL 429306000; 429231800; 429217000; 429245000; 429231950; 429223000;
429224000; 429231100CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38ST polymer lithium **battery** ionic electrolyte

IT Fluoropolymers, uses

Polyimides, uses

(binder; polymer lithium **battery** with ionic
electrolyte)

IT Polysiloxanes, uses

(fluorine-contg., matrix; polymer lithium **battery** with
ionic electrolyte)

IT Polysiloxanes, uses

(fluoro, matrix; polymer lithium **battery** with ionic
electrolyte)IT Secondary **batteries**(lithium; polymer lithium **battery** with ionic
electrolyte)

IT Epoxy resins, uses

Polyoxyalkylenes, uses

Polyurethanes, uses

(matrix; polymer lithium **battery** with ionic
electrolyte)IT **Battery** anodes

Battery cathodes**Battery electrolytes****Secondary battery separators**(polymer lithium **battery** with ionic electrolyte)

IT Alloys, uses

Carbonaceous materials (technological products)

Glass fibers, uses

Intermetallic compounds

Petroleum coke

Polyolefins

Synthetic polymeric fibers, uses

(polymer lithium **battery** with ionic electrolyte)

IT Fluoropolymers, uses

(polysiloxane-, matrix; polymer lithium **battery** with ionic electrolyte)IT **7440-44-0**, Activated carbon, uses(activated; polymer lithium **battery** with ionic electrolyte)

IT 9002-84-0, Ptfе 24937-79-9, Pvdф 25038-71-5,

Ethylene-tetrafluoroethylene copolymer

(binder; polymer lithium **battery** with ionic electrolyte)

IT 7631-86-9, Fumed silica, uses

(colloidal, filler; polymer lithium **battery** with ionic electrolyte)

IT 7440-02-0, Nickel, uses 7440-50-8, Copper, uses 12597-68-1,

Stainless steel, uses

(current collector; polymer lithium **battery** with ionic electrolyte)IT **1344-28-1**, Alumina, uses **13463-67-7**,**Titania**, uses(filler; polymer lithium **battery** with ionic electrolyte)

IT 9003-05-8, Polyacrylamide 9003-20-7, Polyvinyl acetate

9003-39-8, Polyvinylpyrrolidone 9011-14-7, Pmma 25014-41-9,

Polyacrylonitrile 25322-68-3, Peo 31900-57-9,

Polydimethylsiloxane 49717-87-5, 2-Propenoic acid, ion(1-), homopolymer, uses

(matrix; polymer lithium **battery** with ionic electrolyte)

IT 7719-12-2, Phosphorus trichloride 10294-34-5, Boron trichloride

13450-90-3, Gallium trichloride

(polymer lithium **battery** with ionic electrolyte)

IT 554-13-2, Lithium carbonate 1308-38-9, Chromium oxide cr2o3, uses

1309-37-1, Ferric oxide, uses 1310-65-2, Lithium hydroxide

1313-13-9, Manganese dioxide, uses 1314-62-1, Vanadium oxide

(V2O5), uses 1317-38-0, Copper oxide cuo, uses 7446-70-0,

Aluminum chloride, uses 7447-41-8, Lithium chloride (LiCl), uses

7632-51-1 7719-09-7, Thionyl chloride **7782-42-5, Graphite**, uses 7789-24-4, Lithium fluoride, uses 7790-69-4, Lithium nitrate 7791-25-5, Sulfuryl chloride 9002-88-4, Polyethylene 9003-07-0, Polypropylene 9016-80-2, Polymethylpentene 10025-67-9, Sulfur chloride S_2Cl_2 10026-04-7 10377-48-7, Lithium sulfate **10377-52-3**, Trilithium phosphate 10545-99-0, Sulfur chloride SCl_2 12017-00-4, Cobalt oxide CoO 12031-65-1, Lithium nickel oxide LiNiO_2 12031-80-0, Lithium oxide Li_2O 12057-17-9, Lithium manganese oxide LiMn_2O_4 12057-24-8, Lithium oxide (Li_2O), uses 12057-29-3, Lithium phosphide Li_3P 12136-58-2, Lithium sulfide (Li_2S) **12190-79-3**, Cobalt lithium oxide CoLiO_2 12678-32-9, Lithium phosphide Li_2P_5 14024-11-4, Lithium tetrachloroaluminate 15955-98-3, Lithium tetrachlorogallate 18282-10-5, Tin dioxide 21324-40-3, Lithium hexafluorophosphate 26134-62-3, Lithium nitride (Li_3N) 62852-65-7, Lithium decachlorodecaborate(2-) 111853-04-4 177997-13-6, Aluminum Cobalt lithium nickel oxide 182442-95-1, Cobalt lithium manganese nickel oxide 255063-53-7, Aluminum cobalt lithium nickel oxide $\text{Al}_{0.03}\text{Co}_{0.17}\text{LiNi}_{0.802}$ 285136-11-0, Cobalt lithium manganese **titanium oxide** 301334-62-3, Chromium Cobalt lithium manganese oxide 429678-65-9, Cobalt lithium magnesium manganese oxide (polymer lithium **battery** with ionic electrolyte)

IT 293-51-6D, Cyclotetrasiloxane, fluoropropyl Me derivs., polymers (polymer lithium **battery** with ionic electrolyte)

L70 ANSWER 20 OF 36 HCA COPYRIGHT 2006 ACS on STN

139:87745 Solid-state lithium **battery** with **graphite** anode. Takada, Kazunori; Inada, Taro; Kajiyama, Akihisa; Sasaki, Hideki; Kondo, Shigeo; Watanabe, Mamoru; Murayama, Masahiro; Kanno, Ryoji (Advanced Materials Laboratory, National Institute for Materials Science, Tsukuba, Ibaraki, 305-0044, Japan). Solid State Ionics, 158(3,4), 269-274 (English) **2003**. CODEN: SSIOD3. ISSN: 0167-2738. Publisher: Elsevier Science B.V..

AB Solid-state Li **batteries** with a unique construction are presented. These **batteries** contain 2 kinds of Li-ion conducting solid electrolytes, $\text{LiI-Li}_2\text{S-P}_2\text{S}_5$ glass contacted with the anode material and **$\text{Li}_3\text{PO}_4\text{-Li}_2\text{S-SiS}_2$** glass or $\text{Li}_2\text{S-GeS}_2\text{-P}_2\text{S}_5$ cryst. material contacted with the **cathode**. The former electrolyte is stable for electrochem. redn. and the other two for oxidn. This construction enabled use of a **graphite** anode and a **LiCoO_2** cathode in a solid-state Li **battery**. The energy d. of the **battery** was 390 W-h/L and 160 W-h/kg taking the vol. or wt. of the **cathode** and anode layers into account. These results are comparable to those of com. Li-ion **batteries**.

IT **7782-42-5, Graphite**, uses (anode; solid-state lithium **battery** with

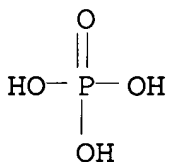
graphite anode)
 RN 7782-42-5 HCA
 CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

IT 12190-79-3, Cobalt lithium oxide (CoLiO₂)
 (cathode; solid-state lithium battery with
 graphite anode)
 RN 12190-79-3 HCA
 CN Cobalt lithium oxide (CoLiO₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IT 10377-52-3, Lithium phosphate (Li₃PO₄)
 (electrolyte; solid-state lithium battery with
 graphite anode)
 RN 10377-52-3 HCA
 CN Phosphoric acid, trilithium salt (8CI, 9CI) (CA INDEX NAME)



●3 Li

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST lithium battery graphite anode solid electrolyte
 IT Secondary batteries
 (lithium; solid-state lithium battery with
 graphite anode)
 IT Battery anodes
 Battery cathodes
 Battery electrolytes
 Solid electrolytes
 Solid state secondary batteries
 (solid-state lithium battery with graphite

- anode)
- IT 7782-42-5, Graphite, uses
(anode; solid-state lithium **battery** with
graphite anode)
- IT 12190-79-3, Cobalt lithium oxide (CoLiO₂)
(cathode; solid-state lithium **battery** with
graphite anode)
- IT 10377-51-2, Lithium iodide (LiI) 10377-52-3, Lithium
phosphate (Li₃PO₄) 12025-34-2, Germanium sulfide (GeS₂)
12136-58-2, Lithium sulfide (Li₂S) 13759-10-9, Silicon sulfide
(SiS₂) 140435-84-3, Phosphorus sulfide (P₂S₅)
(electrolyte; solid-state lithium **battery** with
graphite anode)
- L70 ANSWER 21 OF 36 HCA COPYRIGHT 2006 ACS on STN
139:24139 Secondary nonaqueous electrolyte **battery** and its
manufacture. Okada, Mikio (Japan Storage Battery Co., Ltd., Japan).
Jpn. Kokai Tokkyo Koho JP 2003173770 A2 20030620, 10 pp.
(Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-370438 20011204.
- AB The **battery** has electrodes, contg. active mass particles
and a conductor, and a nonaq. electrolyte; where the active mass
particles and the conductor has a Li⁺-conductive glass coated on
≥1 part of their surface. The **battery** is manufd.
by prepg. the electrodes and covering the Li⁺-conductive glass on
the active mass particles and the conductor.
- IT 7782-42-5, Graphite, uses
(anode active mass; electrodes contg. active mass and conductors
with lithium conductive glass coatings for secondary lithium
batteries)
- RN 7782-42-5 HCA
CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

- IT 12031-75-3, Lithium manganese nickel oxide (LiMn_{1.5}Ni_{0.5}O₄)
(cathode active mass; electrodes contg. active mass and
conductors with lithium conductive glass coatings for secondary
lithium **batteries**)
- RN 12031-75-3 HCA
CN Lithium manganese nickel oxide (Li₂Mn₃NiO₈) (9CI) (CA INDEX NAME)

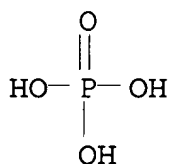
Component	Ratio	Component Registry Number
=====	=====	=====
O	8	17778-80-2
Ni	1	7440-02-0
Mn	3	7439-96-5

Li | 2 | 7439-93-2

IT 10377-52-3, Lithium phosphate 113066-89-0, Cobalt lithium nickel oxide (Co_{0.2}LiNi_{0.8}O₂)
(electrodes contg. active mass and conductors with lithium conductive glass coatings for secondary lithium **batteries**)

RN 10377-52-3 HCA

CN Phosphoric acid, trilithium salt (8CI, 9CI) (CA INDEX NAME)



●3 Li

RN 113066-89-0 HCA

CN Cobalt lithium nickel oxide (Co_{0.2}LiNi_{0.8}O₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====		
O	2	17778-80-2
Co	0.2	7440-48-4
Ni	0.8	7440-02-0
Li	1	7439-93-2

IC ICM H01M004-02
ICS H01M004-58; H01M004-62; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium secondary **battery** manuf electrode lithium conductive glass coating

IT **Carbon black**, uses
(electrode conductor; electrodes contg. active mass and conductors with lithium conductive glass coatings for secondary lithium **batteries**)

IT **Battery** electrodes
(electrodes contg. active mass and conductors with lithium conductive glass coatings for secondary lithium **batteries**)

IT **Secondary batteries**
(lithium; electrodes contg. active mass and conductors with lithium conductive glass coatings for secondary lithium

batteries)

- IT 7782-42-5, Graphite, uses 113443-18-8, Silicon oxide (SiO)
(anode active mass; electrodes contg. active mass and conductors with lithium conductive glass coatings for secondary lithium batteries)
- IT 12031-75-3, Lithium manganese nickel oxide (LiMn_{1.5}Ni_{0.5}O₄)
(cathode active mass; electrodes contg. active mass and conductors with lithium conductive glass coatings for secondary lithium batteries)
- IT 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer
10377-52-3, Lithium phosphate 13453-84-4, Lithium silicate
113066-89-0, Cobalt lithium nickel oxide (Co_{0.2}LiNi_{0.8}O₂)
(electrodes contg. active mass and conductors with lithium conductive glass coatings for secondary lithium batteries)
)

L70 ANSWER 22 OF 36 HCA COPYRIGHT 2006 ACS on STN

138:207776 Secondary lithium **battery** and its manufacture.

Nagura, Kensuke; Yamamoto, Toru (Matsushita Electric Industrial Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2003059492 A2
20030228, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION:
JP 2001-248272 20010817.

AB The **battery** has a coating layer, contg. a conductor and a Li⁺ conducting inorg. solid electrolyte, on active mass particles of **cathode** and/or anode; and is prepd. by mech. depositing or binding the conductor and electrolyte particles on the active mass particles; softening or melting the electrolyte particles by heating the active mass particles; and binding or embodying the fused electrolyte particles by cooling the active mass particles. The **battery** has good high-rate discharge characteristics and long cycle life.

IT 7782-42-5, Graphite, uses
(anode active mass; manuf. of inorg. solid electrolytes and conductor coated active mass particles for secondary lithium **battery** electrodes)

RN 7782-42-5 HCA

CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

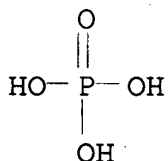
IT 12190-79-3, Cobalt lithium oxide (CoLiO₂)
(cathode active mass; manuf. of inorg. solid electrolytes and conductor coated active mass particles for secondary lithium **battery** electrodes)

RN 12190-79-3 HCA

CN Cobalt lithium oxide (CoLiO₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IT 10377-52-3, Lithium phosphate (**Li₃PO₄**)
 (solid electrolyte; manuf. of inorg. solid electrolytes and
 conductor coated active mass particles for secondary lithium
battery electrodes)
 RN 10377-52-3 HCA
 CN Phosphoric acid, trilithium salt (8CI, 9CI) (CA INDEX NAME)



●3 Li

IC ICM H01M004-62
 ICS H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST lithium secondary **battery** electrode manuf coating
 conductor inorg electrolyte
 IT **Carbon black**, uses
 (conductor; manuf. of inorg. solid electrolytes and conductor
 coated active mass particles for secondary lithium
battery electrodes)
 IT Secondary **batteries**
 (lithium; manuf. of inorg. solid electrolytes and conductor
 coated active mass particles for secondary lithium
battery electrodes)
 IT 7782-42-5, **Graphite**, uses 53351-82-9
 (anode active mass; manuf. of inorg. solid electrolytes and
 conductor coated active mass particles for secondary lithium
battery electrodes)
 IT 1314-62-1, Vanadium oxide (V2O5), uses 12190-79-3, Cobalt
 lithium oxide (CoLiO2) 17101-36-9, Diphosphite
 (cathode active mass; manuf. of inorg. solid
 electrolytes and conductor coated active mass particles for
 secondary lithium **battery** electrodes)

IT 10377-52-3, Lithium phosphate (Li_3PO_4)
12136-58-2, Lithium sulfide 13759-10-9, Silicon sulfide (SiS_2)
107685-64-3, Lithium silicon vanadium oxide ($\text{Li}_{3.4}\text{Si}_{0.4}\text{V}_{0.6}\text{O}_4$)
(solid electrolyte; manuf. of inorg. solid electrolytes and
conductor coated active mass particles for secondary lithium
battery electrodes)

L70 ANSWER 23 OF 36 HCA COPYRIGHT 2006 ACS on STN

138:173266 Nanostructured composites: a high capacity, fast rate
 $\text{Li}_3\text{V}_2(\text{PO}_4)_3/\text{carbon}$ **cathode** for rechargeable lithium
batteries. Huang, Huan; Yin, Shieh-Chieh; Kerr, Tracy;
Taylor, Nicholas; Nazar, Linda F. (Department of Chemistry,
University of Waterloo, Waterloo, ON, N2L 3G1, Can.). Advanced
Materials (Weinheim, Germany), 14(21), 1525-1528 (English)
2002. CODEN: ADVMEW. ISSN: 0935-9648. Publisher:
Wiley-VCH Verlag GmbH & Co. KGaA.

AB The first single crystal anal. and electrochem. characteristics of a
relatively unexplored phosphate, monoclinic $\text{Li}_3\text{V}_2(\text{PO}_4)_3$, that
contains three independent lithium sites are presented. It was
shown that wrapping insulating crystallites of this material within
a conductive carbon web to form a nanostructured composite results
in full access of the capacity at fast rates. Unlike the bulk
material, all three Li^+ are extractable at room temp. on oxidn. at
current rates as high as 1 Li/h. The third Li^+ potential is at 4.55
V, making this a high-potential material with an excellent capacity
of 200 mA-h/g. The electrochem. properties of monoclinic
 $\text{Li}_3\text{V}_2(\text{PO}_4)_3/\text{C}$ were studied using std. cells with a metallic lithium
counter electrode serving as the Li-ion source. The material showed
a surprisingly high sp. capacity, even when cycled at current
densities of 1.6 mA/cm². The nanostructured composite approach was
shown to be generally applicable and promising. $\text{Li}_3\text{V}_2(\text{PO}_4)_3/\text{C}$
achieves almost full capacity with excellent rate capability and
stability at room temp. Cycling in the 3.0-4.8 V voltage window
demonstrates it is a high energy material (av. potential of 3.85 V
vs. Li) with a sp. energy d. of 2330 mW-h/cm³ comparable to other
materials such as LiCoO_2 (2750 mW-h/cm³) and
 LiFePO_4 (2065 mW-h/cm³).

IT 7440-44-0, Carbon, uses
(characterization of high capacity, fast rate lithium vanadium
phosphate/carbon nanostructured composite **cathode** for
rechargeable lithium **batteries**)

RN 7440-44-0 HCA

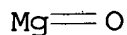
CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

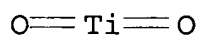
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

- ST lithium vanadium phosphate carbon nanostructured composite
cathode battery
- IT **Battery cathodes**
(characterization of high capacity, fast rate lithium vanadium phosphate/carbon nanostructured composite **cathode** for rechargeable lithium **batteries**)
- IT **7440-44-0**, Carbon, uses 84159-18-2, Lithium vanadium phosphate [Li3V2(PO4)3]
(characterization of high capacity, fast rate lithium vanadium phosphate/carbon nanostructured composite **cathode** for rechargeable lithium **batteries**)
- L70 ANSWER 24 OF 36 HCA COPYRIGHT 2006 ACS on STN
138:140062 Method of fabrication of lithium polymer **battery**.
Naarmann, Herbert; Kruger, Franz Josef (Dilo Trading AG, Switz.).
Ger. Offen. DE 10134057 A1 **20030206**, 8 pp. (German).
CODEN: GWXXBX. APPLICATION: DE 2001-10134057 20010713.
- AB A masterbatch consists of: conducting salt plus org. solvent, org. filler, inorg. scaffolding material, org. polymers as adhesion promoters and elec. conductive addns. serving as intermediate layer. Excellent adhesion is obtained both on the anode as well as on the **cathode** side; it serves simultaneously as a reservoir for conducting salt and solvent and permits a practically resistance-free passage of the charged particles as mediator. Beyond that, this batch is the start basis for anode and/or **cathode** mass. The batch plus anode-specific addns. results in the anode. The batch plus **cathode**-specific addns. results in the **cathode**. The processing is done by **laminates**, which are provided with conductors with which the masterbatch **lamine** is processed as intermediate phase, for example, to the wrapping cells.
- IT **7440-44-0**, Carbon, uses
(mesocarbon microbeads; method of fabrication of lithium polymer **battery**)
- RN 7440-44-0 HCA
CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)
- C
- IT **7782-42-5**, Graphite, uses
(method of fabrication of lithium polymer **battery**)
- RN 7782-42-5 HCA
CN Graphite (8CI, 9CI) (CA INDEX NAME)
- C

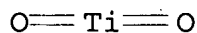
IT 1309-48-4, **Magnesia**, uses 1344-28-1,
Alumina, uses 13463-67-7, **Titania**, uses
 13463-67-7D, **Titanium oxide**, lithiated
 52627-24-4, Cobalt lithium oxide
 (method of fabrication of lithium polymer **battery**)
 RN 1309-48-4 HCA
 CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)



RN 1344-28-1 HCA
 CN Aluminum oxide (Al₂O₃) (8CI, 9CI) (CA INDEX NAME)
 *** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
 RN 13463-67-7 HCA
 CN Titanium oxide (TiO₂) (8CI, 9CI) (CA INDEX NAME)



RN 13463-67-7 HCA
 CN Titanium oxide (TiO₂) (8CI, 9CI) (CA INDEX NAME)



RN 52627-24-4 HCA
 CN Cobalt lithium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Co	x	7440-48-4
Li	x	7439-93-2

IC ICM H01M010-40
 ICS H01M004-36; H01M004-62
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 38
 ST lithium polymer **battery** fabrication
 IT Polyolefins
 (F-contg.; method of fabrication of lithium polymer
battery)
 IT Fluoro rubber
 (hexafluoropropene-vinylidene fluoride; method of fabrication of
 lithium polymer **battery**)
 IT Secondary **batteries**

- (lithium; method of fabrication of lithium polymer **battery**)
- IT Soot
(method of fabrication of lithium polymer **battery**)
- IT Carbon fibers, uses
Ferrites
Fluoro rubber
Isoprene rubber, uses
Silicates, uses
Styrene-butadiene rubber, uses
Titanates
Zeolites (synthetic), uses
(method of fabrication of lithium polymer **battery**)
- IT Polyureas
(thio-; method of fabrication of lithium polymer **battery**)
- IT 9003-31-0
(isoprene rubber, method of fabrication of lithium polymer **battery**)
- IT 7440-44-0, Carbon, uses
(mesocarbon microbeads; method of fabrication of lithium polymer **battery**)
- IT 105-58-8, Ethyl carbonate 108-32-7, Propylene carbonate
463-79-6D, Carbonic acid, alkyl deriv. 872-50-4,
n-Methylpyrrolidone, uses 7440-50-8, Copper, uses 7570-02-7,
DiVinyl carbonate 7782-42-5, Graphite, uses
7791-03-9, Lithium perchlorate 9003-19-4, Polyvinyl ether
9003-39-8, Polyvinyl pyrrolidone 14283-07-9, Lithium
tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate
24980-41-4, Polycaprolactone 171611-11-3 244761-29-3
(method of fabrication of lithium polymer **battery**)
- IT 1309-48-4, Magnesia, uses 1313-13-9D, Manganese
dioxide, lithiated 1314-23-4D, Zirconium oxide, lithiated
1344-28-1, Alumina, uses 7631-86-9, Silica, uses
9011-17-0, Kynar 2801 11098-99-0D, Molybdenum oxide, lithiated
11104-61-3D, Cobalt oxide, lithiated 11116-47-5, Molybdate
11118-57-3D, Chromium oxide, lithiated 13463-67-7,
Titania, uses 13463-67-7D, Titanium
oxide, lithiated 39300-70-4, Lithium nickel oxide
52627-24-4, Cobalt lithium oxide
(method of fabrication of lithium polymer **battery**)
- IT 7440-37-1, Argon, uses
(method of fabrication of lithium polymer **battery**)
- IT 7429-90-5, Aluminum, uses 7439-95-4, Magnesium, uses
(powder; method of fabrication of lithium polymer **battery**)
- IT 9003-55-8
(styrene-butadiene rubber, method of fabrication of lithium

polymer battery)

L70 ANSWER 25 OF 36 HCA COPYRIGHT 2006 ACS on STN

138:15255 Thin solid electrolyte **battery**. Ito, Shuji;
 Iwamoto, Kazuya; Ukaji, Masaya; Nanai, Norishige; Matsuda, Hiromu;
 Mino, Tatsuji; Honda, Kazuyoshi; Takai, Yoriko (Matsushita Electric
 Industrial Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2002352850
 A2 20021206, 11 pp. (Japanese). CODEN: JKXXAF.
 APPLICATION: JP 2001-154955 20010524.

AB The **battery** has successive layers of a 1st collector, a
 first active mass, an electrolyte, a 2nd active mass and a 2nd
 collector connected to elec. conductors; where the thickness of the
 1st active mass layer and the electrolyte layer is 1-20 and 1-10
 μm , resp. Preferably, the collectors are orthogonal to the
 conductor, the electrolyte is $(\text{Li}_2\text{S})_x(\text{Si S}_2)_y(\text{Li}_3\text{PO}_4)_z$
 $[(x+y+z)=1, x=0.3-0.8, y=0.2-0.7 \text{ and } z=0.01-0.3]$, and the 1st or 2nd
 active mass is $\text{Li}_3\text{-aMaN}$ ($0.2 < a < 0.6$; $\text{M} = \text{Co, Ni, Cu and/or Mn}$).

IT 7440-44-0, Carbon, uses
 (anodes in thin secondary lithium **batteries** using solid
 electrolytes)

RN 7440-44-0 HCA

CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

IT 12190-79-3, Cobalt lithium oxide (CoLiO_2)
 (cathodes in thin secondary lithium **batteries**
 using solid electrolytes).

RN 12190-79-3 HCA

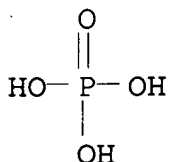
CN Cobalt lithium oxide (CoLiO_2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IT 10377-52-3, Lithium phosphate (Li_3PO_4)
 (compns. of solid electrolyte for thin secondary lithium
batteries)

RN 10377-52-3 HCA

CN Phosphoric acid, trilithium salt (8CI, 9CI) (CA INDEX NAME)



●3 Li

- IC ICM H01M010-36
ICS H01M010-36; H01M002-26; H01M002-30; H01M004-02; H01M004-58
- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
- ST thin **battery** solid electrolyte lithium metal nitride electrode
- IT **Battery** anodes
(anodes in thin secondary lithium **batteries** using solid electrolytes)
- IT **Carbonaceous** materials (technological products)
(anodes in thin secondary lithium **batteries** using solid electrolytes)
- IT **Battery** electrolytes
(compns. of solid electrolyte for thin secondary lithium **batteries**)
- IT Secondary **batteries**
(lithium; compns. of thin secondary lithium **batteries** contg. solid electrolytes and lithium nitride anodes)
- IT 7439-93-2, Lithium, uses **7440-44-0**, Carbon, uses 12798-95-7 174421-80-8, Cobalt lithium nitride (Co_{0.4}Li_{2.6}N)
(anodes in thin secondary lithium **batteries** using solid electrolytes)
- IT 1314-62-1, Vanadium oxide (V₂O₅), uses 12031-65-1, Lithium nickel oxide (LiNiO₂) 12057-17-9, Lithium manganese oxide (LiMn₂O₄) **12190-79-3**, Cobalt lithium oxide (CoLiO₂)
(**cathodes** in thin secondary lithium **batteries** using solid electrolytes)
- IT 10377-51-2, Lithium iodide (LiI) **10377-52-3**, Lithium phosphate (**Li₃PO₄**) 12136-58-2, Lithium sulfide (Li₂S) 13759-10-9, Silicon sulfide (SiS₂) 90076-65-6, Lithium bis(trifluoromethanesulfonyl) imide 201471-17-2, Lithium phosphate sulfide thiosilicate (Li_{1.29}(PO₄)_{0.01}SO_{0.27}(SiS₃)_{0.36}) 477704-33-9, Lithium nitride oxide phosphide (Li_{2.9}N_{0.46}O_{3.3}P)
(compns. of solid electrolyte for thin secondary lithium **batteries**)

137:355435 Method for manufacture of solid electrolyte **battery**
. Segawa, Ken; Iwakoshi, Yasunobu; Ohba, Kazuhiro (Sony Corporation, Japan). Eur. Pat. Appl. EP 1256993 A2 20021113, 15 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR. (English). CODEN: EPXXDW. APPLICATION: EP 2002-10367 20020507. PRIORITY: JP 2001-137753 20010508.

AB A solid electrolyte **battery** includes a **battery** element in which a **cathode** having a **cathode** composite mixt. layer formed by applying a **cathode** composite mixt. on a **cathode** current collector so as to provide a part to which the **cathode** composite mixt. is not applied at an end part in the longitudinal direction of the **cathode** current collector and an anode having an anode composite mixt. layer formed by applying an anode composite mixt. on an anode current collector so as to provide a part to which the anode composite mixt. is not applied at an end part in the longitudinal direction of the anode current collector are **laminated** so as to provide a solid electrolyte layer between the **cathode** and the anode. Porous members made of ceramics or non-woven fabrics are arranged between the longitudinal end parts of the **cathode** composite mixt. layer and the longitudinal end parts of the anode composite mixt. layer to extend to the parts of the **cathode** current collector to which the **cathode** composite mixt. is not applied. Thus, a short-circuit in the end parts of the **cathode** composite mixt. layer is prevented and yield upon manufg. the solid electrolyte **battery** is improved. ~.

IT 1344-28-1, Aluminum oxide (Al₂O₃)
, uses
(fiber, fabrics; method for manuf. of solid electrolyte **battery**)

RN 1344-28-1 HCA

CN Aluminum oxide (Al₂O₃) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

IT 7782-42-5, Graphite, uses
(method for manuf. of solid electrolyte **battery**)

RN 7782-42-5 HCA

CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

IT 12190-79-3P, Cobalt lithium oxide colio₂
(method for manuf. of solid electrolyte **battery**)

RN 12190-79-3 HCA

CN Cobalt lithium oxide (CoLiO₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IC ICM H01M010-04
ICS H01M010-40; H01M002-16

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST **battery** solid electrolyte

IT Synthetic fibers
(**aluminum oxide**, fabrics; method for manuf.
of solid electrolyte **battery**)

IT Short circuits
(prevention; method for manuf. of solid electrolyte
battery)

IT Primary **batteries**
(solid-state; method for manuf. of solid electrolyte
battery)

IT 1344-28-1, **Aluminum oxide (Al₂O₃)**, uses
(fiber, fabrics; method for manuf. of solid electrolyte
battery)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate
108-32-7, Propylene carbonate 7782-42-5, **Graphite**
, uses 9011-17-0, Hexafluoropropylene-vinylidene fluoride
copolymer
(method for manuf. of solid electrolyte **battery**)

IT 12190-79-3P, Cobalt lithium oxide colio2
(method for manuf. of solid electrolyte **battery**)

L70 ANSWER 27 OF 36 HCA COPYRIGHT 2006 ACS on STN

137:327379 Continuous production of trilaminates by coextrusion for
polymer lithium **batteries**. Naarmann, Herbert; Kruger,
Franz Josef; Schaefer, Tim (Dilo Trading A.-G., Switz.). Ger.
Offen. DE 10118639 A1 20021024, 10 pp. (German). CODEN:
GWXXBX. APPLICATION: DE 2001-10118639 20010412.

AB The invention concerns the prodn. of Trilamainates, consisting of an
anode composite, polymer electrolytes and a **cathode**
composite, which are provided on the **cathode** side and on
the anode side with a metallic grid. The prodn. is carried out
continuously, preferably via coextrusion. The systems thus obtained
form the basis for rechargeable polymer lithium **batteries**.
The procedure according to invention contains the prodn. of anode
masses, **cathode** material as well as the polymer gel
electrolyte, which are: (1) homogeneously developed, (2) agree in
structural viscosity and rheol., and (3) defined in shape by

extrusion; and can be continuously formed as bands with reproducible wts. and **laminated**. The anode mass consists of **graphite**, preferably synthetic, e.g., mesocarbon microbeads with spherical particles or **graphite** fibers as well as a polymer binder e.g. polyfluoroelastomeres, polyolefins, polybutadiene or styrene copolymers, as well as polymethacrylates with alc. residues C4-C20, and polyvinyl compds. such as polyvinylpyrrolidone, polyvinylimidazole, polyvinylpyridin etc. and their copolymers, e.g. with methacrylic acid ester with alc. residues C4-C20, and a conducting salt e.g., LiPF₆ or Li oxalato borates, etc.

IT **7782-42-5, Graphite**, uses **12190-79-3**,
Cobalt lithium oxide colio₂ **39302-37-9**, Lithium
titanium oxide
(continuous prodn. of trilaminates by coextrusion for polymer
lithium **batteries**)
RN 7782-42-5 HCA
CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

RN 12190-79-3 HCA
CN Cobalt lithium oxide (CoLiO₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====+=====+=====		
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

RN 39302-37-9 HCA
CN Lithium titanium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====+=====+=====		
O	x	17778-80-2
Ti	x	7440-32-6
Li	x	7439-93-2

IT **7440-44-0**, Carbon, uses
(mesocarbon microbeads; continuous prodn. of trilaminates by
coextrusion for polymer lithium **batteries**)
RN 7440-44-0 HCA
CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

- IC ICM H01M010-38
ICS H01M010-40
- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
- ST lithium secondary **battery** polymer trilaminate coextrusion
- IT **Battery** anodes
 Battery cathodes
 Extrusion of plastics and rubbers
 Laminated materials
 (continuous prodn. of trilaminates by coextrusion for polymer
 lithium **batteries**)
- IT Fluoro rubber
Isoprene-styrene rubber
Polyolefins
 (continuous prodn. of trilaminates by coextrusion for polymer
 lithium **batteries**)
- IT Zeolites (synthetic), uses
 (continuous prodn. of trilaminates by coextrusion for polymer
 lithium **batteries**)
- IT Carbon fibers, uses
 (**graphite**; continuous prodn. of trilaminates by
 coextrusion for polymer lithium **batteries**)
- IT Secondary **batteries**
 (lithium; continuous prodn. of trilaminates by coextrusion for
 polymer lithium **batteries**)
- IT **Battery** electrolytes
 (polymer gel; continuous prodn. of trilaminates by coextrusion
 for polymer lithium **batteries**)
- IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate
7782-42-5, **Graphite**, uses 7791-03-9, Lithium
perchlorate 9003-17-2, Polybutadiene 9003-39-8,
Polyvinylpyrrolidone 9003-47-8, Polyvinylpyridine 9003-53-6,
Polystyrene 12031-65-1, Lithium nickel oxide linio2 12057-17-9,
Lithium manganese oxide limn2o4 12190-79-3, Cobalt lithium
oxide colio2 14283-07-9, Lithium tetrafluoroborate 21324-40-3,
Lithium hexafluorophosphate 25087-26-7D, Polymethacrylic acid,
alkyl esters, with C4-20 alcs. 25232-42-2, Polyvinylimidazole
33454-82-9, Lithium triflate 37296-91-6, Lithium molybdenum oxide
37349-20-5, Lithium tungsten oxide 39302-37-9, Lithium
titanium oxide 473540-08-8
 (continuous prodn. of trilaminates by coextrusion for polymer
 lithium **batteries**)
- IT 7631-86-9, Silica, uses 9011-17-0, Kynar 2801
 (continuous prodn. of trilaminates by coextrusion for polymer
 lithium **batteries**)

- IT 25038-32-8
(isoprene-styrene rubber, continuous prodn. of trilaminates by coextrusion for polymer lithium **batteries**)
- IT 7440-44-0, Carbon, uses
(mesocarbon microbeads; continuous prodn. of trilaminates by coextrusion for polymer lithium **batteries**)
- L70 ANSWER 28 OF 36 HCA COPYRIGHT 2006 ACS on STN
134:210518 Process for large scale fabrication of lithium polymer **batteries** with solid electrolytes in the film technology.
Meislitzer, Karl Heinz (Bangert, Wolfgang, Germany; Sebastian, Rudolf). Ger. Offen. DE 19941861 A1 **20010315**, 12 pp.
(German). CODEN: GWXXBX. APPLICATION: DE 1999-19941861 19990902.
- AB Films for **cathodes** and anodes as well as for the electrolytes are pulled from pastes of suitable compn. and prepn. **Cathode** pastes are prepd. from: 3-10% polymer or copolymer, PEO, polystyrene, polyvinyl chloride, polyvinylidene fluoride, or polyvinylidene fluoride-hexafluoropropylene copolymer (PVDF-HFP); 4-12% plasticizer (e.g., dibutylphthalate or dioctyl phthalate); 20-60 g% intercalation material (e.g., **LiCoO₂**, **LiNiO₂**, **LiCo_xNi_{1-x}O₂**, **LiMn₂O₄** or **VO_x**); 2-10% elec. conductor (e.g., **graphite** powder or amorphous C); and 40-80% solvent (e.g., acetone). Anode paste comprises: 3-10% polymer or copolymer (e.g., PEO, polystyrene, PVC, PVDF, or PVDF-HFP copolymer), 4-12% plasticizer (di-Bu phthalate or dioctyl phthalate), 20-40% elec. conductor (**graphite** powder or amorphous C), and 40-80% solvent (acetone). The electrolyte paste comprises: 3-10 g% polymer or copolymer (PEO, polystyrene, PVC, PVDF or hexafluoropropylene-vinylidene fluoride copolymer), 4-12% plasticizer (DBP or DOP), 20-40% ionic conductor (**Li₉AlSiO₈**, **Li_{1.3}Al_{0.3}Ti_{1.7}(PO₄)₃**, **LiTi₂(PO₄)₃**, **Li₂O** or **Li₄SiO₄.Li₃PO₄**), 2-10% ionic conductor (**LiClO₄**, **LiBF₄**, **LiCl**, **LiBr**, or **LiI**) and 40-80 g% solvent (acetone).
- IT 7440-44-0, Carbon, uses
(amorphous; process for large scale fabrication of lithium polymer **batteries** with solid electrolytes in film technol.)
- RN 7440-44-0 HCA
CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)
- C
- IT 12190-79-3, Cobalt lithium oxide colio2 131344-56-4
, Cobalt lithium nickel oxide
(process for large scale fabrication of lithium polymer **batteries** with solid electrolytes in film technol.)
- RN 12190-79-3 HCA

CN Cobalt lithium oxide (CoLiO₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====+=====+=====		
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

RN 131344-56-4 HCA

CN Cobalt lithium nickel oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====+=====+=====		
O	x	17778-80-2
Co	x	7440-48-4
Ni	x	7440-02-0
Li	x	7439-93-2

IT **7782-42-5, Graphite, uses**
(process for large scale fabrication of lithium polymer
batteries with solid electrolytes in film technol.)

RN 7782-42-5 HCA

CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

IC ICM H01M004-04

ICS H01M004-62; H01M004-48

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38

ST lithium polymer electrolyte **battery** prodn film technol

IT Polyurethanes, uses

(acrylates, coatings; process for large scale fabrication of
lithium polymer **batteries** with solid electrolytes in
film technol.)

IT **Secondary batteries**

(lithium; process for large scale fabrication of lithium polymer
batteries with solid electrolytes in film technol.)

IT **Battery anodes**

Battery cathodes

Films

(process for large scale fabrication of lithium polymer
batteries with solid electrolytes in film technol.)

IT Fluoropolymers, uses

Polyoxyalkylenes, uses

- (process for large scale fabrication of lithium polymer **batteries** with solid electrolytes in film technol.)
- IT 7440-44-0, Carbon, uses
(amorphous; process for large scale fabrication of lithium polymer **batteries** with solid electrolytes in film technol.)
- IT 7440-50-8, Copper, uses
(film, current collector; process for large scale fabrication of lithium polymer **batteries** with solid electrolytes in film technol.)
- IT 84-74-2, Dibutyl phthalate 117-84-0, Dioctyl phthalate
(plasticizer; process for large scale fabrication of lithium polymer **batteries** with solid electrolytes in film technol.)
- IT 9002-86-2, Polyvinyl chloride 9003-53-6, Polystyrene 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer 11099-11-9, Vanadium oxide 12031-65-1, Lithium nickel oxide LiNiO_2 12057-17-9, Lithium manganese oxide LiMn_2O_4 12190-79-3, Cobalt lithium oxide CoLiO_2 24937-79-9, Polyvinylidene fluoride 25322-68-3, PEO 131344-56-4, Cobalt lithium nickel oxide
(process for large scale fabrication of lithium polymer **batteries** with solid electrolytes in film technol.)
- IT 7447-41-8, Lithium chloride, uses 7550-35-8, Lithium bromide 7791-03-9, Lithium perchlorate 10377-51-2, Lithium iodide 14283-07-9, Lithium tetrafluoroborate 30622-39-0, Lithium titanium phosphate $\text{LiTi}_2(\text{PO}_4)_3$ 120479-61-0, Aluminum lithium titanium phosphate $\text{Al}_{0.3}\text{Li}_{1.3}\text{Ti}_{1.7}(\text{PO}_4)_3$ 138728-82-2, Lithium phosphate silicate $(\text{Li}_{3.5}(\text{PO}_4)_0.5(\text{SiO}_4)_0.5)$ 180728-17-0, Aluminum lithium oxide silicate $(\text{AlLi}_9\text{O}_4(\text{SiO}_4))$ 328899-26-9, Lithium titanium oxide phosphate $(\text{Li}_3\text{Ti}_2\text{O}(\text{PO}_4)_3)$
(process for large scale fabrication of lithium polymer **batteries** with solid electrolytes in film technol.)
- IT 7782-42-5, Graphite, uses
(process for large scale fabrication of lithium polymer **batteries** with solid electrolytes in film technol.)
- IT 67-64-1, Acetone, uses
(process for large scale fabrication of lithium polymer **batteries** with solid electrolytes in film technol.)

L70 ANSWER 29 OF 36 HCA COPYRIGHT 2006 ACS on STN

134:118337 Solid **laminated batteries** using oxide ceramics. Hara, Toru; Kitahara, Nobuyuki; Kamimura, Toshihiko; Mishima, Hiromitsu; Magome, Shinji; Osaki, Makoto; Higuchi, Hisashi (Kyocera Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2001015152 A2 20010119, 5 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1999-184432 19990629.

AB The **batteries** comprise stacks of **cathodes**, solid electrolytes, and anodes, all of them comprising oxide ceramics,

bonded together in series and/or in parallel with elec. insulating polymer adhesives and/or elec. conductive polymer adhesives. The oxide ceramic electrolytes and electrodes prevent deterioration of the characteristics of **batteries** (e.g., secondary Li **batteries**), and the voltage and capacity of the **batteries** can be set to arbitrary values by **lamination** of the **battery** components with the polymer adhesives.

IT 7440-44-0, Carbon, uses 7782-42-5,
Graphite, uses
 (elec. conductive filler; solid **batteries** using
 electrodes and electrolytes of oxide ceramics **laminated**
 with elec. insulating and/or conducting polymer adhesives)

RN 7440-44-0 HCA
 CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

RN 7782-42-5 HCA
 CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

IT 13463-67-7, **Titanium oxide**, uses
 39302-37-9, **Lithium titanium oxide**
 52627-24-4, Cobalt lithium oxide 123921-35-7,
Lithium titanium oxide (Li_{1.33}Ti_{1.67}O₄)
 131344-56-4, Cobalt lithium nickel oxide
 (solid **batteries** using electrodes and electrolytes of
 oxide ceramics **laminated** with elec. insulating and/or
 conducting polymer adhesives)

RN 13463-67-7 HCA
 CN Titanium oxide (TiO₂) (8CI, 9CI) (CA INDEX NAME)

O=Ti=O

RN 39302-37-9 HCA
 CN Lithium titanium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Ti	x	7440-32-6
Li	x	7439-93-2

RN 52627-24-4 HCA

CN Cobalt lithium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Co	x	7440-48-4
Li	x	7439-93-2

RN 123921-35-7 HCA

CN Lithium titanium oxide (Li_{1.33}Ti_{1.67}O₄) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	4	17778-80-2
Ti	1.67	7440-32-6
Li	1.33	7439-93-2

RN 131344-56-4 HCA

CN Cobalt lithium nickel oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Co	x	7440-48-4
Ni	x	7440-02-0
Li	x	7439-93-2

IC ICM H01M010-36

ICS H01M004-02; H01M004-62; H01M006-18

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 57ST **laminated battery** electrode electrolyte oxide
ceramic; lithium **battery** solid electrolyte oxide ceramicIT **Carbon black**, uses
(elec. conductive filler dopant; solid **batteries** using
electrodes and electrolytes of oxide ceramics **laminated**
with elec. insulating and/or conducting polymer adhesives)IT Secondary **batteries**
(lithium; solid **batteries** using electrodes and
electrolytes of oxide ceramics **laminated** with elec.
insulating and/or conducting polymer adhesives)IT Adhesives
Battery anodes

Battery cathodes**Battery electrolytes**

Ceramics

Electric conductors

Electric insulators

(solid **batteries** using electrodes and electrolytes of oxide ceramics **laminated** with elec. insulating and/or conducting polymer adhesives)

IT Acrylic polymers, uses

Epoxy resins, uses

Oxides (inorganic), uses

Phenolic resins, uses

Polyamides, uses

Polyesters, uses

Polyimides, uses

Polysiloxanes, uses

(solid **batteries** using electrodes and electrolytes of oxide ceramics **laminated** with elec. insulating and/or conducting polymer adhesives)

IT 1312-43-2, Indium oxide 1314-13-2, Zinc oxide, uses 1327-33-9,

Antimony oxide 1332-29-2, Tin oxide 7440-02-0, Nickel, uses

7440-22-4, Silver, uses 7440-44-0, Carbon, uses

7440-50-8, Copper, uses 7440-57-5, Gold, uses 7782-42-5,

Graphite, uses 12673-69-7, Potassium titanate

(elec. conductive filler; solid **batteries** using electrodes and electrolytes of oxide ceramics **laminated** with elec. insulating and/or conducting polymer adhesives)

IT 1313-13-9, Manganese dioxide, uses 1313-96-8, Niobium oxide

1314-35-8, Tungsten oxide, uses 11099-11-9, Vanadium oxide

11126-15-1, Lithium vanadium oxide 13463-67-7,

Titanium oxide, uses 39300-70-4, Lithium nickel

oxide 39302-37-9, Lithium **titanium oxide**

39457-42-6, Lithium manganese oxide 52627-24-4, Cobalt

lithium oxide 111418-37-2, Germanium lithium vanadium oxide

(Ge_{0.6}Li_{3.6}V_{0.4}O₄) 120479-61-0, Aluminum lithium titanium

phosphate (a_{10.3}li_{1.3}ti_{1.7}(po₄)₃) 123921-35-7, Lithium

titanium oxide (Li_{1.33}Ti_{1.67}O₄)

131344-56-4, Cobalt lithium nickel oxide 155472-68-7,

Lithium manganese oxide (Li_{1.1}Mn_{1.9}O₄)

290347-96-5, Lithium iodide

metaphosphate oxide (Li₅₆I₁₅(PO₃)₂₉O₆)

320591-13-7, Lithium

niobium borate oxide (Li_{1.05}Nb_{0.25}(BO₃)_{0.70}O₁)

(solid **batteries** using electrodes and electrolytes of oxide ceramics **laminated** with elec. insulating and/or conducting polymer adhesives)

L70 ANSWER 30 OF 36 HCA COPYRIGHT 2006 ACS on STN

131:102667 Electrochemically polymerizable compositions for solid electrolytes. Takeuchi, Masataka; Ohkubo, Takashi; Yabe, Shoji

(Showa Denko K. K., Japan). Jpn. Kokai Tokkyo Koho JP 11171910 A2 19990629 Heisei, 24 pp. (Japanese). CODEN: JKXXAF.
APPLICATION: JP 1997-343251 19971212.

AB Title compns. contain ≥ 1 polymerizable compds. and ≥ 1 electrochem. decomposable polymn. initiator precursors and the solid electrolytes are those prepd. by polymn. of the compds. The electrolytes are suitable for **battery** electrodes contg. electrode active masses, for elec. double layer capacitors contg. polar materials, and the **batteries** and capacitors themselves and manuf. of them are also claimed. Thus, polyethylene glycol dimethacrylate (Blemmer PDE 600) 1.2, **Al₂O₃** (**Aluminum oxide C**) 0.33, ethylene carbonate 1.8, Et Me carbonate 4.2, LiBF₄ 0.45, and Bu₄N⁺ BuPh₃B⁻ 0.005 g were mixed under Ar to give title compn., which was applied on a Pt film then the film was **laminated** with another Pt film, charged (4 V) for 1 min, and left at room temp. for 15 min to give a composite film having ion cond. 1.5×10^{-3} and 0.3×10^{-3} S/cm at 25 and -20°, resp.

IT **12190-79-3**, Lithium cobalt oxide (**LiCoO₂**)
(**cathode** active mass; monomer compn. contg. electrochem decomposable polymn. initiator precursors for solid electrolytes for **batteries** and double layer capacitors)

RN 12190-79-3 HCA

CN Cobalt lithium oxide (CoLiO₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====+=====+=====		
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IT **1344-28-1**, Aluminum oxide (**Al₂O₃**)
, uses
(fillers; monomer compn. contg. electrochem decomposable polymn. initiator precursors for solid electrolytes for **batteries** and double layer capacitors)

RN 1344-28-1 HCA

CN Aluminum oxide (Al₂O₃) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

IC ICM C08F002-58

ICS H01B001-12; H01G009-025; H01M004-02; H01M004-04; H01M004-06;
H01M006-18; H01M010-40; C08F020-10; C08F299-02

CC 35-3 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 38, 52, 76

ST polymerizable compn electrochem decomposable polymn initiator; solid electrolyte monomer compn polymn initiator; polyethylene glycol dimethacrylate solid electrolyte precursor; butyltriphenylborate

- tetrabutylammonium polymn initiator precursor; **battery**
electrode solid electrolyte polymerizable compn; double layer
capacitor electrolyte polymerizable compn
- IT Polycarbonates, preparation
Polyoxyalkylenes, preparation
(acrylic; monomer compn. contg. electrochem decomposable polymn.
initiator precursors for solid electrolytes for **batteries**
and double layer capacitors)
- IT Fluoropolymers, uses
Fluoropolymers, uses
(anode from; monomer compn. contg. electrochem decomposable
polymn. initiator precursors for solid electrolytes for
batteries and double layer capacitors)
- IT Capacitors
(double layer; monomer compn. contg. electrochem decomposable
polymn. initiator precursors for solid electrolytes for
batteries and double layer capacitors)
- IT Alkali metal salts
Quaternary ammonium compounds, uses
(electrolyte; monomer compn. contg. electrochem decomposable
polymn. initiator precursors for solid electrolytes for
batteries and double layer capacitors)
- IT Acids, uses
Phosphonium compounds
Transition metal salts
(electrolytes; monomer compn. contg. electrochem decomposable
polymn. initiator precursors for solid electrolytes for
batteries and double layer capacitors)
- IT Carbon fibers, uses
(**graphite**, **battery** anode; monomer compn.
contg. electrochem decomposable polymn. initiator precursors for
solid electrolytes for **batteries** and double layer
capacitors)
- IT Secondary **batteries**
(lithium; monomer compn. contg. electrochem decomposable polymn.
initiator precursors for solid electrolytes for **batteries**
and double layer capacitors)
- IT Polymerization catalysts
Solid electrolytes
(monomer compn. contg. electrochem decomposable polymn. initiator
precursors for solid electrolytes for **batteries** and
double layer capacitors)
- IT 26403-58-7DP, polymer with ethylene oxide-propylene oxide copolymer,
adduct with isocyanatoethyl methacrylate
(Blemmer AE 400; monomer compn. contg. electrochem decomposable
polymn. initiator precursors for solid electrolytes for
batteries and double layer capacitors)
- IT 24937-79-9

- (anode from; monomer compn. contg. electrochem decomposable polymn. initiator precursors for solid electrolytes for **batteries** and double layer capacitors)
- IT 12190-79-3, Lithium cobalt oxide (LiCoO_2)
(cathode active mass; monomer compn. contg. electrochem decomposable polymn. initiator precursors for solid electrolytes for **batteries** and double layer capacitors)
- IT 429-06-1, Tetraethylammonium tetrafluoroborate 69444-47-9, Triethylmethylammonium tetrafluoroborate
(electrolyte; monomer compn. contg. electrochem decomposable polymn. initiator precursors for solid electrolytes for **batteries** and double layer capacitors)
- IT 1344-28-1, Aluminum oxide (Al_2O_3)
) , uses 112760-18-6, KW 2200
(fillers; monomer compn. contg. electrochem decomposable polymn. initiator precursors for solid electrolytes for **batteries** and double layer capacitors)
- IT 143-66-8, Sodium tetraphenylborate 120307-06-4, Tetrabutylammonium butyltriphenylborate 189947-86-2 228863-57-8
(monomer compn. contg. electrochem decomposable polymn. initiator precursors for solid electrolytes for **batteries** and double layer capacitors)
- IT 9004-74-4DP, Polyethylene glycol monomethyl ether, reaction product with isocyanatoethyl methacrylate, polymers 9051-34-7P
9082-00-2DP, Ethylene oxide-propylene oxide copolymer glycerin ether ; reaction product with isocyanatoethyl methacrylate, polymers
30674-80-7DP, reaction product with ethylene oxide-propylene oxide copolymer 50862-75-4DP, Poly(oxycarbonyloxy-1,3-propanediyl), reaction product with isocyanatoethyl methacrylate, polymers
87105-87-1P 228863-58-9DP, reaction product with isocyanatoethyl methacrylate, polymers
(monomer compn. contg. electrochem decomposable polymn. initiator precursors for solid electrolytes for **batteries** and double layer capacitors)
- IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate
108-32-7, Propylene carbonate 623-53-0, Ethyl methyl carbonate
(solvent; monomer compn. contg. electrochem decomposable polymn. initiator precursors for solid electrolytes for **batteries** and double layer capacitors)

L70 ANSWER 31 OF 36 HCA COPYRIGHT 2006 ACS on STN

130:225401 Process for producing electrode of nonaqueous electrolyte **battery**. Okada, Mikio; Hasumi, Takeshi; Yasuda, Hideo
(Japan Storage Battery Company Limited, Japan). Eur. Pat. Appl. EP 905804 A2 19990331, 15 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW. APPLICATION: EP 1998-114939 19980807. PRIORITY: JP 1997-227257 19970808; JP 1997-227258

19970808; JP 1997-335044 19971118.

AB In a process for producing an electrode of a nonaq. electrolyte **battery**, an electrode and a polymer paste are prepd. The electrode is made of a metal as a current collector and an active material layer thereon. The polymer paste has a polymer dissolved in a solvent sol. in water. The polymer paste is allowed to be held in the electrode. Thereafter, the solvent is extd. from the polymer paste with an aq. soln. contg. an alc. (1-70%), phosphorous or phosphorous compd (phosphoric acid or phosphate at 1×10^{-7} to 1M). The primary alc. is MeOH or EtOH and the metallic current collector is Al or Cu.

IT 12190-79-3, Cobalt lithium oxide colio2
(process for producing electrode of nonaq. electrolyte **battery**)

RN 12190-79-3 HCA

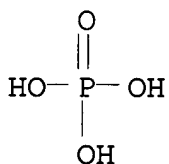
CN Cobalt lithium oxide (CoLiO2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IT 10377-52-3, Lithium phosphate
(solvent extn. by; process for producing electrode of nonaq. electrolyte **battery**)

RN 10377-52-3 HCA

CN Phosphoric acid, trilithium salt (8CI, 9CI) (CA INDEX NAME)



●3 Li

IC ICM H01M004-02

ICS H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST electrode manuf nonaq electrolyte **battery**

IT Secondary **batteries**

(lithium; process for producing electrode of nonaq. electrolyte **battery**)

- IT **Battery anodes**
 Battery cathodes
 (process for producing electrode of nonaq. electrolyte
 battery)
- IT **Carbon black, uses**
 (process for producing electrode of nonaq. electrolyte
 battery)
- IT **Fluoropolymers, uses**
 (process for producing electrode of nonaq. electrolyte
 battery)
- IT 7429-90-5, Aluminum, uses 7440-50-8, Copper, uses
 (current collector; process for producing electrode of nonaq.
 electrolyte **battery**)
- IT **12190-79-3, Cobalt lithium oxide colio2**
 (process for producing electrode of nonaq. electrolyte
 battery)
- IT 7722-88-5
 (process for producing electrode of nonaq. electrolyte
 battery)
- IT 64-17-5, Ethanol, uses 67-56-1, Methanol, uses 872-50-4, Nmp,
 uses 24937-79-9, PvdF
 (process for producing electrode of nonaq. electrolyte
 battery)
- IT 1327-47-5, Metaphosphoric acid, ammonium salt 2466-09-3,
 Pyrophosphoric acid 7320-34-5, Pyrophosphoric acid, tetrapotassium
 salt 7758-16-9, Pyrophosphoric acid, disodium salt 7782-95-8,
 Hypophosphoric acid, disodium salt 10402-25-2, Iron pyrophosphate
 13597-86-9, Pyrophosphoric acid, diammonium salt 13721-43-2,
 Hypophosphoric acid, tetrasodium salt 14691-79-3, Hypophosphoric
 acid, trisodium salt 14691-84-0, Pyrophosphoric acid, dipotassium
 salt 39692-18-7 56484-10-7 158115-20-9
 (solvent extn. by; process for producing electrode of nonaq.
 electrolyte **battery**)
- IT 512-56-1, Trimethyl orthophosphate 7558-79-4, Disodium hydrogen
 phosphate 7558-80-7, Sodium dihydrogen phosphate 7601-54-9,
 Trisodium phosphate 7664-38-2, Phosphoric acid, uses 7722-76-1,
 Ammonium dihydrogen phosphate 7723-14-0D, Phosphorus, compds.,
 uses 7757-86-0, Magnesium hydrogen phosphate 7757-87-1
 7758-11-4, Dipotassium hydrogen phosphate 7758-23-8, Calcium
 dihydrogen phosphate 7758-87-4, Tricalcium phosphate 7778-53-2,
 Tripotassium phosphate 7778-77-0, Potassium dihydrogen phosphate
 7783-28-0, DiAmmonium hydrogen phosphate 7785-21-9, Ammonium
 magnesium phosphate 7785-84-4, Trisodium metaphosphate
 10343-62-1, Metaphosphoric acid **10377-52-3**, Lithium
 phosphate 13011-54-6, Ammonium sodium hydrogen phosphate
 13453-80-0, Lithium dihydrogen phosphate 13530-50-2, Aluminum
 dihydrogen phosphate 15823-35-5 18266-28-9 18718-07-5
 25513-23-9 33689-84-8, Triphosphoric acid, disodium salt

(solvent extn. by; process for producing electrode of nonaq.
electrolyte **battery**)

L70 ANSWER 32 OF 36 HCA COPYRIGHT 2006 ACS on STN

129:333327 Composite anode for secondary lithium-ion **battery**.

Takada, Kazunori; Fujino, Makoto; Iwamoto, Kazuya; Kondo, Shigeo
(Matsushita Electric Industrial Co., Ltd., Japan). Eur. Pat. Appl.
EP 875951 A1 **19981104**, 23 pp. DESIGNATED STATES: R: AT,
BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI,
LT, LV, FI, RO. (English). CODEN: EPXXDW. APPLICATION: EP
1998-105635 19980327. PRIORITY: JP 1997-112995 19970430.

AB The title **battery** anode comprises a 1st component where
intercalation and de-intercalation of Li occur in charging and
discharging, resp., and a 2nd component formed on the 1st component
to prevent dendritic deposition of Li. The 2nd component shows
electronic-ionic mixed conduction and is preferably semiconductive
and selected from Li-intercalating transition metal oxides and
sulfides, and Li-ion conductive electrolytes. The 1st component is
electronically conductive and elec. connected to the anode terminal,
its electronic cond. is higher than that of the 2nd component.

IT **12190-79-3P**, Cobalt lithium oxide (CoLiO₂)
(**cathode** in secondary lithium-ion **battery**)

RN 12190-79-3 HCA

CN Cobalt lithium oxide (CoLiO₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====+=====+=====		
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IT **7782-42-5**, Graphite, uses
(in composite anode for secondary lithium-ion **battery**)

RN 7782-42-5 HCA

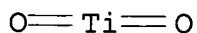
CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

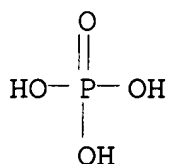
IT **13463-67-7D**, Titania, lithium-doped
(in composite anode for secondary lithium-ion **battery**)

RN 13463-67-7 HCA

CN Titanium oxide (TiO₂) (8CI, 9CI) (CA INDEX NAME)



IT 10377-52-3, Lithium phosphate (**Li₃PO₄**)
 (in glass in composite anode for secondary lithium-ion
battery)
 RN 10377-52-3 HCA
 CN Phosphoric acid, trilithium salt (8CI, 9CI) (CA INDEX NAME)



●3 Li

IC ICM H01M004-02
 ICS H01M010-40; H01M004-48; H01M004-58
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 49
 ST lithium ion **battery** composite anode; transition metal
 oxide composite **battery** anode; sulfide transition metal
 composite **battery** anode
 IT **Battery** anodes
 (composite lithium-ion)
 IT Glass, uses
 (oxysulfide; in composite anode for secondary lithium-ion
battery)
 IT 12031-65-1P, Lithium nickel oxide (**LiNiO₂**) 12057-17-9P, Lithium
 manganese oxide (**LiMn₂O₄**) 12190-79-3P, Cobalt lithium
 oxide (**CoLiO₂**)
 (**cathode** in secondary lithium-ion **battery**)
 IT 7440-02-0, Nickel, uses 7440-50-8, Copper, uses 12597-68-1,
 Stainless steel, uses
 (foil in composite anode for secondary lithium-ion
battery)
 IT 7782-42-5, Graphite, uses
 (in composite anode for secondary lithium-ion **battery**)
 IT 1314-35-8D, Tungsten oxide (**WO₃**), lithium-doped, uses 1314-62-1D,
 Vanadium pentoxide, lithium-doped 13463-67-7D,
Titania, lithium-doped
 (in composite anode for secondary lithium-ion **battery**)
 IT 12532-74-0P, Lanthanum lithium **titanium oxide**
 (**La_{0.5}Li_{0.5}TiO₃**) 120479-61-0P, Aluminum lithium titanium phosphate
 (**Al_{0.3}Li_{1.3}Ti_{1.7}(PO₄)₃**)
 (in composite anode for secondary lithium-ion **battery**)
 IT 10377-52-3, Lithium phosphate (**Li₃PO₄**)

12136-58-2, Lithium sulfide 13759-10-9, Silicon disulfide
(in glass in composite anode for secondary lithium-ion
battery)

L70 ANSWER 33 OF 36 HCA COPYRIGHT 2006 ACS on STN

127:360948 Secondary nonaqueous electrolyte **batteries**. Inoue,
Hiroshi; Inoue, Akiyuki (Fuji Photo Film Co., Ltd., Japan). Jpn.
Kokai Tokkyo Koho JP 09283180 A2 19971031 Heisei, 10 pp.
(Japanese). CODEN: JKXXAF. APPLICATION: JP 1996-94496 19960416.

AB The **batteries** have Li intercalating anodes, Li salt
electrolyte solns., and Li intercalating **cathodes**; where
the **cathodes** have ≥ 2 layers with different active
mass content applied on a **cathode** collector. The layer
farthermost from the collector contains 10-60% active mass and may
contain insulator oxide particles, e.g., **TiO₂**, and the
other layers contain 70-98% active mass. The anode active mass is
amorphous chalcogenide or oxide and the **cathode** active
mass is a Li transition metal oxide. These **batteries** have
low self discharge.

IT 1344-28-1, **Alumina**, uses 7782-42-5,
Graphite, uses
(anodes contg. **alumina** for secondary lithium
batteries with **multilayer cathodes**)

RN 1344-28-1 HCA

CN Aluminum oxide (Al₂O₃) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

RN 7782-42-5 HCA

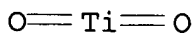
CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

IT 13463-67-7, **Titanium oxide (TiO₂)**, uses
(**cathodes** and anodes contg. **titania** for
secondary lithium **batteries** with **multilayer**
cathodes)

RN 13463-67-7 HCA

CN Titanium oxide (TiO₂) (8CI, 9CI) (CA INDEX NAME)



IT 12190-79-3, Cobalt lithium oxide (CoLiO₂)
191536-38-6, Cobalt lithium nickel oxide
(Co_{0.1}-0.9Li_{0.02}-1.2Ni_{0.1}-0.9O₂) 191536-43-3, Lithium
manganese nickel oxide (Li_{0.02}-1.2Mn_{1.6}-1.96Ni_{0.04}-0.4O₄)
(**multilayer cathodes** contg. **titania**)

in surface layer for secondary lithium **batteries**)

RN 12190-79-3 HCA

CN Cobalt lithium oxide (CoLiO₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

RN 191536-38-6 HCA

CN Cobalt lithium nickel oxide (Co_{0.1-0.9}Li_{0.02-1.2}Ni_{0.1-0.902}) (9CI)
(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	0.1 - 0.9	7440-48-4
Ni	0.1 - 0.9	7440-02-0
Li	0.02 - 1.2	7439-93-2

RN 191536-43-3 HCA

CN Lithium manganese nickel oxide (Li_{0.02-1.2}Mn_{1.6-1.96}Ni_{0.04-0.404})
(9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	4	17778-80-2
Ni	0.04 - 0.4	7440-02-0
Mn	1.6 - 1.96	7439-96-5
Li	0.02 - 1.2	7439-93-2

IC ICM H01M010-40

ICS H01M004-02; H01M004-58; H01M004-62

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST **battery** lithium transition metal oxide **cathode**;
lithium transition metal oxide **multilayer cathode**

IT **Battery cathodes**

(**multilayer cathodes** contg. **titania**

in surface layer for secondary lithium **batteries**)

IT **Secondary batteries**

(secondary lithium **batteries** with **multilayer**
cathodes contg. **titania** in surface layer)

IT 191536-36-4, Lithium nickel oxide (Li_{0.02-1.2}NiO₂)
(2 **multilayer cathodes** contg. **titania**)

- in surface layer for secondary lithium **batteries**)
- IT 1344-28-1, Alumina, uses 7782-42-5,
Graphite, uses
(anodes contg. **alumina** for secondary lithium
batteries with **multilayer cathodes**)
- IT 191536-30-8P 192061-39-5P 192061-40-8P 192132-88-0P
192132-89-1P
(anodes for secondary lithium **batteries** with
multilayer cathodes)
- IT 13463-67-7, Titanium oxide (TiO_2)
, uses
(**cathodes** and anodes contg. **titania** for
secondary lithium **batteries** with **multilayer**
cathodes)
- IT 12190-79-3, Cobalt lithium oxide (CoLiO_2) 191536-37-5,
Lithium manganese oxide ($\text{Li}_{0.02}\text{-1.2MnO}_2$) 191536-38-6,
Cobalt lithium nickel oxide ($\text{Co}_{0.1}\text{-0.9Li}_{0.02}\text{-1.2Ni}_{0.1}\text{-0.9O}_2$)
191536-41-1, Lithium manganese oxide ($\text{Li}_{0.02}\text{-1.2Mn}_{2\text{O}_4}$)
191536-42-2, Cobalt lithium manganese oxide ($\text{Co}_{0.04}\text{-0.4Li}_{0.02}\text{-1.2Mn}_{1.6}\text{-1.96O}_4$) 191536-43-3, Lithium manganese nickel
oxide ($\text{Li}_{0.02}\text{-1.2Mn}_{1.6}\text{-1.96Ni}_{0.04}\text{-0.4O}_4$) 191536-45-5, Lithium
manganese vanadium oxide ($\text{Li}_{0.02}\text{-1.2Mn}_{1.6}\text{-1.96V}_{0.04}\text{-0.4O}_4$)
191536-46-6, Iron lithium manganese oxide ($\text{Fe}_{0.04}\text{-0.4Li}_{0.02}\text{-1.2Mn}_{1.6}\text{-1.96O}_4$) 198562-60-6, Cobalt lithium vanadium oxide
($\text{Co}_{0.9}\text{-0.98Li}_{0.02}\text{-1.2V}_{0.02}\text{-0.1O}_{2.01}\text{-2.3}$) 198562-61-7, Cobalt iron
lithium oxide ($\text{Co}_{0.9}\text{-0.98Fe}_{0.02}\text{-0.1Li}_{0.02}\text{-1.2O}_2$)
(**multilayer cathodes** contg. **titania**
in surface layer for secondary lithium **batteries**)
- L70 ANSWER 34 OF 36 HCA COPYRIGHT 2006 ACS on STN
125:200870 Secondary solid lithium **batteries** with improved
electrolytes. Iwamoto, Kazuya; Aotani, Noboru; Takada, Kazunori;
Kondo, Shigeo (Matsushita Electric Ind Co Ltd, Japan). Jpn. Kokai
Tokkyo Koho JP 08195219 A2 19960730 Heisei, 10 pp.
(Japanese). CODEN: JKXXAF. APPLICATION: JP 1995-221366 19950830.
PRIORITY: JP 1994-279174 19941114.
- AB The **batteries** use anodes and/or **cathodes** from
3.0:7.0-9.5:0.5 (wt. ratio) mixts. of the active mass having av.
diam. 0.1-50 μm and solid electrolytes having av. diam. 0.1-50
 μm , preferably which are Li ion-conducting amorphous
sulfide-based electrolytes. Alternatively, the **batteries**
use anodes and/or **cathodes** contg. (1) Li ion-conducting
amorphous sulfide-based solid electrolytes, and (2) Co Li oxides
having av. diam. 5-50 μm , preferably which are manufd. from Co
oxide (preferably Co_3O_4) and Li compds. at a mixing ratio of Co/Li
<1.0. The anodes and/or **cathodes** may contain the Co Li
oxides and the electrolytes at a wt. ratio of oxide:electrolyte
4.0:6.0-9.5:0.5.

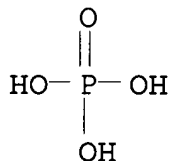
IT 7782-42-5, Graphite, uses
 (cathodes; battery electrolytes from
 sized-controlled sulfide-based glass contained in anodes or
 cathodes)
 RN 7782-42-5 HCA
 CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

IT 12190-79-3P, Cobalt lithium oxide (CoLiO₂)
 (cathodes; battery electrolytes from
 sized-controlled sulfide-based glass contained in anodes or
 cathodes)
 RN 12190-79-3 HCA
 CN Cobalt lithium oxide (CoLiO₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IT 10377-52-3, Lithium phosphate
 (glass component; battery electrolytes from
 sized-controlled sulfide-based glass contained in anodes or
 cathodes)
 RN 10377-52-3 HCA
 CN Phosphoric acid, trilithium salt (8CI, 9CI) (CA INDEX NAME)



●3 Li

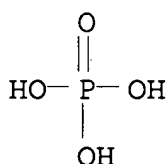
IC ICM H01M010-36
 ICS H01M004-02
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST battery electrolyte sulfide glass; cobalt lithium oxide
 battery cathode
 IT Battery electrolytes

- (**battery** electrolytes from size-controlled sulfide-based glass contained in anodes or **cathodes**)
- IT Glass, nonoxide
(sulfide, **battery** electrolytes from size-controlled sulfide-based glass contained in anodes or **cathodes**)
- IT 554-13-2, Lithium carbonate 1308-06-1, Cobalt oxide (Co₃O₄)
(anodes from; **battery** electrolytes from sized-controlled sulfide-based glass contained in anodes or **cathodes**)
- IT 12136-58-2, Lithium sulfide 13759-10-9, Silicon sulfide (SiS₂)
140435-84-3, Phosphorus sulfide (P₂S₅)
(**battery** electrolytes from sized-controlled sulfide-based glass contained in anodes or **cathodes**)
- IT 7782-42-5, Graphite, uses 12031-65-1, Lithium nickel oxide (LiNiO₂) 12039-13-3, Titanium disulfide
(**cathodes**; **battery** electrolytes from sized-controlled sulfide-based glass contained in anodes or **cathodes**)
- IT 12190-79-3P, Cobalt lithium oxide (CoLiO₂)
(**cathodes**; **battery** electrolytes from sized-controlled sulfide-based glass contained in anodes or **cathodes**)
- IT 10377-52-3, Lithium phosphate 12057-24-8, Lithium oxide, uses 178958-56-0, Lithium silicon oxide
(glass component; **battery** electrolytes from sized-controlled sulfide-based glass contained in anodes or **cathodes**)
- L70 ANSWER 35 OF 36 HCA COPYRIGHT 2006 ACS on STN
- 125:15214 Solid electrolyte lithium **batteries**. Takada, Kazunori; Aotani, Noboru; Iwamoto, Kazuya; Kondo, Shigeo (Matsushita Electric Ind Co Ltd, Japan). Jpn. Kokai Tokkyo Koho JP 08096836 A2 19960412 Heisei, 6 pp. (Japanese). CODEN: JKXXAF.
APPLICATION: JP 1994-226581 19940921.
- AB The **batteries** have a Li⁺ conducting solid electrolyte between electrodes, where the electrolyte contains at least Li₂S and SiS₂ and 1 of the electrodes is a transition metal oxide contg. ≤0.1% **carbonaceous** materials or free of **carbonaceous** material.
- IT 52627-24-4, Cobalt lithium oxide
(**carbonaceous** material free **cathodes** for secondary lithium **batteries** using lithium silicon sulfide based solid electrolytes)
- RN 52627-24-4 HCA
- CN Cobalt lithium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
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=====+=====+=====		
O	x	17778-80-2
Co	x	7440-48-4
Li	x	7439-93-2

IT 10377-52-3, Lithium phosphate
 (compns. of lithium ion conductive solid electrolytes for
 secondary lithium **batteries**)
 RN 10377-52-3 HCA
 CN Phosphoric acid, trilithium salt (8CI, 9CI) (CA INDEX NAME)



●3 Li

IC ICM H01M010-36
 ICS H01M004-02; H01M004-58
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST lithium sulfide silicon sulfide **battery** electrolyte;
 transition metal oxide **cathode** carbon free
 IT **Battery** electrolytes
 (compns. of lithium ion conductive solid electrolytes for
 secondary lithium **batteries**)
 IT **Cathodes**
 (**battery**, **carbonaceous** material free
cathodes for secondary lithium **batteries** using
 lithium silicon sulfide based solid electrolytes)
 IT 1314-35-8, Tungsten trioxide, uses 1314-62-1, Vanadium pentoxide,
 uses 12057-17-9, Lithium manganese oxide (LiMn2O4) 12162-92-4,
 Lithium vanadium oxide (LiV2O5) 39300-70-4, Lithium nickel oxide
 52627-24-4, Cobalt lithium oxide 130811-82-4, Cobalt
 lithium manganese oxide (Co0.2LiMn1.8O4)
 (**carbonaceous** material free **cathodes** for
 secondary lithium **batteries** using lithium silicon
 sulfide based solid electrolytes)
 IT 10377-51-2, Lithium iodide 10377-52-3, Lithium phosphate
 12057-24-8, Lithium oxide, uses 12136-58-2, Lithium sulfide
 13759-10-9, Silicon sulfide (SiS2) 161286-52-8, Lithium sulfide
 thiosilicate (Li1.2S0.2(SiS3)0.4) 161286-54-0, Lithium phosphate
 sulfide thiosilicate (Li1.24(PO4)0.02S0.2(SiS3)0.39) 161487-41-8,
 Lithium iodide thiosilicate (LiI0.3(SiS3)0.35) 177532-89-7,

Lithium oxide sulfide thiosilicate ($\text{Li}_{1.2200.02}\text{S}_{0.2}(\text{SiS}_3)_{0.39}$)
(compns. of lithium ion conductive solid electrolytes for
secondary lithium **batteries**)

L70 ANSWER 36 OF 36 HCA COPYRIGHT 2006 ACS on STN

120:168824 Secondary lithium **battery**. Kamauchi, Masahiro;
Soejima, Hiroshi; Kubota, Shuji; Sasaki, Kouzou (Mitsubishi Cable
Industries, Ltd., Japan). Eur. Pat. Appl. EP 571858 A1
19931201, 28 pp. DESIGNATED STATES: R: DE, FR, GB.
(English). CODEN: EPXXDW. APPLICATION: EP 1993-108004 19930517.
PRIORITY: JP 1992-124594 19920518.

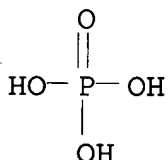
AB The **battery** has an anode, an electrolyte, and a
cathode composed of a **cathode** active material
comprising ≥ 1 member selected from the group consisting of Li
phosphate, Li-Co phosphate, Co oxide, and Li-Co oxide, such that the
Co:P:Li molar ratio is (0.2-1.75):(0.25-1.8):1. The **cathode**
active material is amorphous and has an av. particle size 0.01-20
 μm , the Brunauer-Emmett-Teller sp. surface area 1-100 m^2/g , and a
25-60% porosity. The invention **battery** has a high energy
d. leading to a high discharge capacity, high emf., and high
discharge voltage, and excellent cycle life.

IT **10377-52-3**, Lithium phosphate **52627-24-4**, Cobalt
lithium oxide

(**cathode** active mass contg., manuf. of, for
batteries)

RN 10377-52-3 HCA

CN Phosphoric acid, trilithium salt (8CI, 9CI) (CA INDEX NAME)



●3 Li

RN 52627-24-4 HCA

CN Cobalt lithium oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Co	x	7440-48-4
Li	x	7439-93-2

IC ICM H01M004-58
ICS H01M004-52
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **battery** secondary lithium; lithium phosphate
battery cathode; phosphate lithium cobalt
battery cathode; cobalt lithium oxide
battery cathode
IT Fullerenes
(anode manuf. from, lithium, for **batteries**)
IT **Carbonaceous** materials
(anodes, lithium, for **batteries**)
IT **Batteries**, secondary
(lithium, high-performance)
IT **Cathodes**
(**battery**, cobalt oxide- and/or cobalt lithium oxide-
and/or cobalt lithium phosphate- and/or lithium phosphate-contg.,
manuf. of)
IT 10377-52-3, Lithium phosphate 11104-61-3, Cobalt oxide
12737-30-3, Cobalt nickel oxide 13824-63-0, Cobalt lithium
phosphate 52627-24-4, Cobalt lithium oxide 153456-60-1
(**cathode** active mass contg., manuf. of, for
batteries)
IT 1314-56-3, Phosphorus pentoxide, uses 12057-24-8, Lithium oxide,
uses
(**cathode** active mass manuf. from powd. mixt. contg.,
amorphous, for **batteries**)